

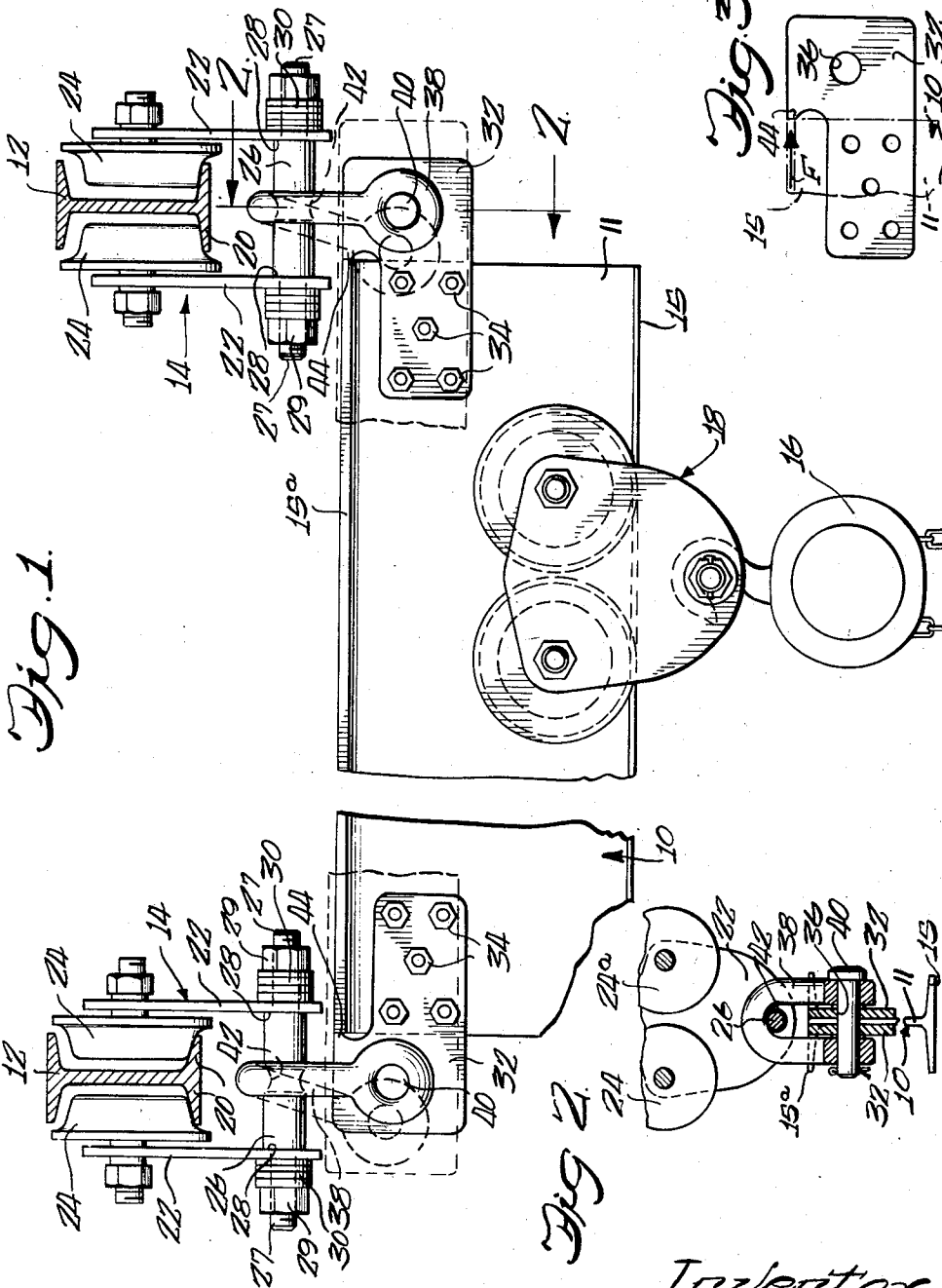
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CRANE

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CRANE

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The present invention relates to a lifting crane for use on a pair of parallel, overhead tracks and more particularly relates to means for mounting the crane cross-beam or bridge on trolleys which are adapted to roll along said tracks.

The principal object of this invention is to provide a simple, lightweight, economical underhung crane attachment for use on a pair of overhead tracks. It is a related object to provide a novel crane arrangement which is ideally suited for sale as a kit.

It is another object to provide a crane construction which requires minimum headroom and which is advantageous in situations where the overhead space is limited.

It is a further object to provide a crane of the above type which is characterized by a high degree of freedom including means for mounting the bridge on trolleys for lateral and fore-and-aft swinging movement relative thereto.

It is still another object to provide a crane of the above character having a novel mounting bracket for suspending the bridge of the crane from the trolleys which is inherently strong and which is proof against sticking or binding when unbalanced forces are applied and which requires no maintenance.

Other objects and advantages will become apparent as the following description proceeds, taken in connection with the accompanying drawings, wherein:

Figure 1 is an elevation view showing a crane having a bridge suspended from trolleys supported on overhead tracks.

Fig. 2 is a vertical fragmentary section taken substantially in the plane of line 2—2 of Fig. 1.

Fig. 3 is a detail view of the mounting bracket.

While the invention is susceptible of various modifications and alternative constructions, a certain illustrative embodiment has been shown in the drawings and will be described below in detail. It should be understood however, that there is no intention to limit the invention to the specific form disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions and equivalents falling within the spirit and scope of the invention as expressed in the appended claims.

Referring now to Fig. 1 of the drawings, there is shown an overhead, underhung type crane which includes a bridge 10 in the form of an I-beam having a web 11 and lower and upper flanges, 15, 15a respectively, supported on parallel tracks 12 by means of trolleys 14. In order to support a cable hoist 16 or the like, a trolley 18, which is similar in construction to the crane supporting trolleys 14, is positioned on the I-beam bridge 10, the lower flange 15 of which forms a track for this purpose. The cable hoist 16 is thus adapted to travel along the bridge 10 and in a transverse direction relative to the overhead tracks 12.

The tracks 12 on which the crane is suspended are, for example, generally parallel, horizontal I-beams, the lower flange 20 of which forms the tracks for supporting the

trolleys 14. One form of these trolleys comprises a pair of spaced apart plates 22, each of which is provided with a pair of flanged wheels 24, 24a, (Fig. 2) rotatably mounted thereon and adapted to roll on the overhead tracks 20. The wheel plates 22 extend downwardly and are held apart at their lowermost ends by a cross bolt 26. The threaded ends 27 of the bolt 26 are of reduced diameter so as to form a shoulder 28 against which the wheel plates are held by means of suitable nuts 29 and spacing washers 30. In addition, these cross bolts provide the main support for the bridge 10 on the trolleys 14, as will be seen as the description proceeds. The hoist trolley 18 is constructed in substantially the same manner as the bridge trolleys 14, and includes a pulley (not shown) or similar attachment in the place of the cross bolt for use with the hoist cable 16.

Provision is made for supporting the bridge 10 on the trolleys 14. Referring to Figs. 2 and 3, it can be seen that this is accomplished by securing a pair of brackets 32 to the vertical web portion of the bridge 10 at each end thereof, by means of bolts 34 or other fasteners. In the present instance, suitable holes are drilled in the web of the bridge beam corresponding to holes in the brackets in order to accommodate the fastening bolts 34. In order to swingably suspend the bridge 10 from the trolley, the brackets 32 are mounted so that they extend beyond the ends of the bridge 10. In order to secure the bridge supporting brackets 32 to the trolleys 14, an inverted U-shaped shackle or yoke 38 is pivotally mounted on a pin 40 inserted through holes 36 in the extending portion of the brackets. The ends of the shackle 38 are enlarged and provided with suitable holes through which the pin 40 may pass. Any desired securing means, such as a cotter pin or the like is used to prevent the pin 40 from slipping out of the shackle and the brackets. The shackle, in turn, is supported on the cross bolt 26 of the trolleys 14, a necked-down portion 42 being formed intermediate the ends thereof to cooperate with the cylindrical surface of the shackle for preventing the latter from sliding between the trolley plates 22 while providing for universal pivoting action between the parts as more fully described below.

When a load is placed on the bridge 10, a moment is exerted on the brackets 32. In order to strengthen the brackets against a failure resulting from this moment, each of them is formed in an L shape so that the longitudinally and upwardly extending leg portion thereof engages the end of the upper flange 15a (Fig. 3). So that each bracket will not interfere with the fillet portion of the bridge I-beam between the flange and the web thereof, a projection 44 is desirably provided on the upstanding bracket leg in a position to abut the end of the upper flange 15a.

When the brackets are secured in place on the web of the bridge and in engagement with the ends of the flange, it can be seen that a force F (Fig. 3) is exerted on the bracket projection 44 when the bridge carries a load. The mounting of the brackets on the bridge is thus strengthened because of the application of the force longitudinally on the bracket.

The above-described bracket configuration substantially simplifies the installation and mounting of the crane because there is no need to cut away any portion of the bridge beam with the exception of the few bracket bolt holes. In addition, the positioning of the brackets with their respective projections in engagement with the bridge flange assures alignment of the holes which receive the shackle pin 40. The brackets are desirably formed from sheet or flat stock, and are effectively prevented from warping under the above-described load by virtue of their abutment with the ends of the bridge.

Referring again to Fig. 1, it can be seen that a hoist bridge mounted on a pair of trolleys by the above described brackets 32 and shackles 38 is free to swing in a lateral direction perpendicular to the tracks (shown in phantom in Fig. 1) as well as in a fore-and-aft direction parallel to the tracks. The lateral swinging movement is provided for by the pivotal connection between the shackle and the brackets, while the fore-and-aft swinging movement is provided for by the provision of the U-shaped shackles 38, swingably mounted on the trolley cross bolts 26. This two-way swinging action is sufficient to prevent the trolleys from binding on the tracks when a heavy load is being supported on the bridge which in turn is being pulled along the tracks. For example, if a load is placed at one end of the bridge and a pull is exerted on the load so as to move the bridge along the tracks, the end on which the load is positioned will not tend to lead the opposite end but, on the contrary, the entire bridge will swing about the shackle pivots in the direction of pull and the trolleys 14 will tend to remain axially aligned and will roll freely along the tracks. If, in some situations, one track should be slightly lower than the other or the tracks should converge or diverge slightly, the pivotal mounting of the bridge brackets 32 on the shackles 38 will compensate for such track irregularities, and the bridge 10 will adjust itself accordingly, relative to the tracks.

Because of the characteristic simplicity and adaptability for rapid mounting, the crane described above is particularly suitable for distribution in kit form. Such a kit would include the hoist, trolleys, and mounting assemblies for use with a bridge beam and overhead tracks furnished by the user. The trolleys 14 are easily mounted on existing overhead tracks by removing or loosening the cross bolt 26 a sufficient amount so that the wheels can be slipped onto the tracks. After the trolleys are secured in position, the shackles 38 are placed on the cross bolts 26 thereof, and the bridge 10, to which the brackets 32 are attached, is secured to the shackles by the shackle pins 40. A hoist on the bridge of a crane having the above characteristics will travel to within a few inches of the ends of the bridge beam and, coupled with narrow bridge trolleys, will provide a maximum coverage of the area under any given set of tracks.

I claim as my invention:

1. A bridge crane for use on a pair of parallel overhead tracks comprising in combination, trolleys adapted to roll along said tracks, an I-beam bridge member including an upper and a lower longitudinal flange, a hoist mounted to travel along said lower flange, and means for suspending said bridge from said trolleys, said means including a pair of substantially L-shaped brackets secured to said bridge at each end and extending longitudinally therefrom, each of said brackets having a pro-

jection thereon engaging the end surface of the upper flange, and means swingably suspended from said trolleys and engaging the extending ends of said brackets for swingably and movably suspending said bridge from said trolleys.

2. A bridge crane suspension device for suspending an I-beam bridge at each end from trolleys movably positioned on two laterally spaced overhead tracks, said suspension device comprising in combination, a pair of substantially L-shaped brackets secured to respective ends of the I-beam bridge and extending longitudinally therefrom, said brackets having a projection thereon engaging the adjacent end surface of the upper flange of the I-beam, and means including a shackle swingably connecting the extending portion of said brackets and a respective one of said trolleys whereby said bridge is suspended from said trolleys for universal swinging movements thereon.

3. In a crane for use on two laterally spaced overhead tracks, the combination comprising a pair of trolleys adapted to roll along said tracks, a bridge beam extending between said trolleys and tracks, a substantially L-shaped bracket secured at each end of said beam, a projection on said brackets engaging the adjacent end surface of said beam, a shackle swingably pinned to each of said brackets, and means on said trolleys swingably supporting said shackles whereby said bridge beam is suspended from said trolleys for universal swinging movements thereon.

4. A bridge crane for use with two laterally spaced overhead tracks comprising, in combination, a pair of trolleys adapted to roll along said tracks, an I-beam bridge having an upper flange and a lower flange for supporting a crane hoist or the like, and means connecting each end of said beam to a respective one of said pair of trolleys, said connecting means comprising an L-shaped bracket secured at one end to said beam and having its other end abutting the end of said upper flange, and a yoke pivotally connected to said bracket and to said trolley for suspending said bridge beam from said trolleys for universal swinging movements thereon.

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