Sept. 8, 1942. G. A. MITCHELL 2,294,998

JIB CRANE

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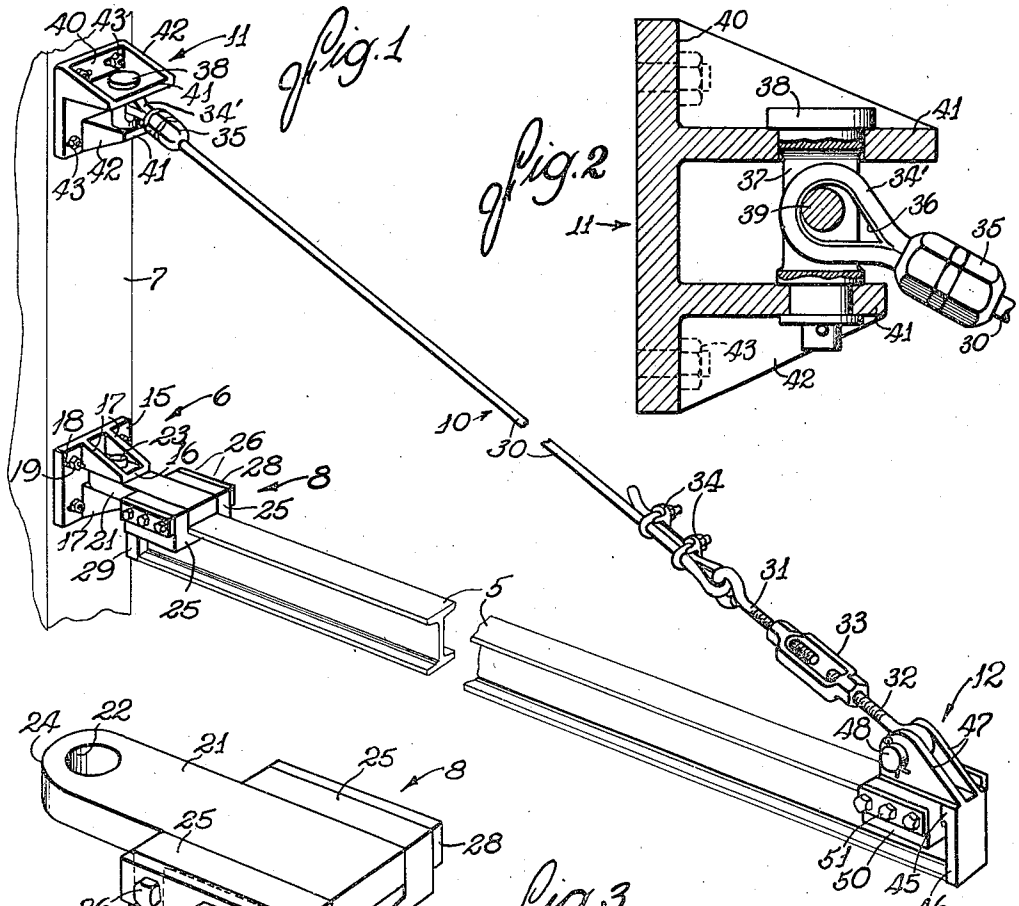


Fig. 1

Fig. 2

Fig. 3

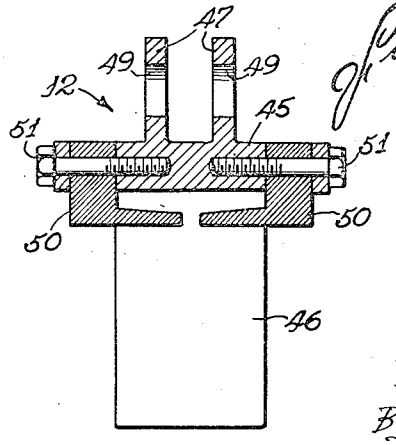


Fig. 4

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JIB CRANE

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3 Claims. (Cl. 248—282)

This invention relates to cranes generally and more particularly to jib cranes.

One object of the invention is to provide a construction assembly for making cranes of the above general character which lends itself readily to shipment in knock-down form and which is adapted to utilize a length of standard beam as the jib or boom thus avoiding the difficulty and expense of shipping the bulkiest part of the crane and enabling the other parts to be packed and shipped in the form of a compact, lightweight kit.

Another object is to provide a construction assembly for making jib cranes including parts adapted for assembly with a beam without requiring drilling or other machining of the same so that the crane may be set up by relatively unskilled workmen using only the simplest of tools.

Still another object is to provide a set of jib crane parts adapted for assembly into cranes of various sizes and capable of meeting a wide range of operating and installation requirements.

Other objects and advantages of the invention will become apparent from the following detailed description of the preferred embodiment illustrated in the accompanying drawing in which:

Figure 1 is a perspective view of a jib crane embodying the features of the invention.

Fig. 2 is a vertical sectional view of the upper bearing bracket of the crane.

Fig. 3 is a perspective view of the member for supporting the inner end of the jib.

Fig. 4 is a vertical sectional view of the outboard stay anchoring member.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In carrying out the invention I provide a compact, lightweight set of parts or fittings adapted to be assembled with a length of standard beam, as for example an I-beam **5**, to form a sturdy and efficient jib crane. The set includes a lower bearing bracket **6** adapted to be secured to a wall, column, post or other upright support **7** and having pivoted thereon a member **8** arranged to receive and support the inner end of the beam **5**. For supporting the outer end of the beam I provide an adjustable stay **10** anchored at one end to an upper bearing bracket **11** secured to the support **7** in vertical spaced relationship to the lower bearing bracket **6**. The other end of the stay is secured to the outer end of the beam by means of an outboard stay anchoring member **12**.

To facilitate installation, the parts cooperating with the beam, namely, the beam supporting member **8** and the stay anchoring member **12** are constructed and arranged to be frictionally clamped thereto by means of a simple tool such as a wrench so that no drilling or other machining of the beam is necessary to condition it for assembly. With this arrangement a suitable length of beam may be obtained locally by the purchaser of the crane with a substantial saving in transportation and handling costs.

In practice, the parts shown in heavy lines in Fig. 1, that is, the parts mentioned above with the exception of the beam **5** constitute the set of parts or kit supplied by the manufacturer. The beam **5** may be of any suitable type. In the particular crane illustrated an I-beam is utilized which is advantageous in that the lower flange provides a track for a conventional hoist supporting trolley.

The bearing brackets **6** and **11**, the supporting member **8** and the stay anchoring member **12** may be in the form of castings or may be fabricated from flat stock by welding or the like. As herein shown the lower bearing bracket **6** comprises a flat, generally rectangular base **15** having on one face a pair of vertically spaced outwardly projecting flanges **16** strengthened by gussets **17** at opposite side edges. The base is provided with suitable apertures preferably in the form of laterally disposed slots **18** for the reception of bolts **19** by which the bracket is secured to the column **7**. The provision of slots allows for variably spacing the bolts as required by posts or columns of various dimensions such as may be encountered in different installations.

An operative connection between the beam and the bearing bracket is provided by the supporting member **8**. In its preferred form this member comprises a rigid, generally rectangular metal bar **21** having one end dimensioned to fit snugly between the flanges **16** of the bearing bracket and the other end arranged to extend over the inner end of the beam **5**. The said one end of the bar is apertured as at **22** (Fig. 3) for the reception of a vertical pivot pin **23** (Fig. 1) projecting through alined apertures in the flanges **16**. The corners of the bar may be rounded as at **24** to provide clearance and allow the bar to

swing in a horizontal plane about the axis of the pin 23.

Any suitable means may be utilized to clamp the bar 21 to the inner end of the beam 5 so that the parts may be assembled with a minimum of labor. When an I-beam is employed for the jib, the clamping means preferably comprises a pair of flanged clamping members 25 (Figs. 1 and 3) removably secured to opposite side edges of the bar as by machine bolts 26. The members are arranged with their flanges turned inwardly to define a channel for receiving the upper flange of the beam. Moreover, the flanges of the members are suitably tapered as indicated at 27 to conform to the shape of the beam flange so that they are enabled to grip the same securely when the screws 26 are tightened. Hardened wear plates 28 may be interposed between the clamping members and the screw heads to reduce wear on the members.

To take up the end thrust of the beam when a load is applied thereto and to maintain the beam in proper relationship to the other parts of the crane, the supporting member 8 is provided with an abutment for engagement by the inner end of the beam. This abutment is preferably in the form of a depending lug 29 and may be formed integrally with the bar 21. The lug preferably extends down substantially to the lower end of the beam to serve as a stop for the hoist supporting trolley.

The outboard end of the beam 5 is supported by the stay 10 extending between the upper bearing bracket 11 and the outboard anchoring member 12. The stay preferably comprises an extensible portion, preferably a length of wire rope or cable 30, secured at one end to an adjustable portion such as a turnbuckle herein shown as consisting of a pair of I-bolts 31 and 32 connected by a right and left hand screw link 33. The cable may be threaded through the I-bolt 31 and locked in place by clamps 34. This arrangement permits initial rough adjustment of the overall length of the stay as required for any particular installation. Fine adjustments may be made by turning the screw link 33 in well known manner.

For anchoring the stay to the upper bearing bracket, the other end of the cable 30 is bent to form a loop 34' (Fig. 2) and locked in place by a suitable clamp 35. A conventional thimble 36 may be inserted in the loop to reduce wear on the cable. As herein shown the looped cable is inserted through a longitudinal slot 37 in a headed pintle 38 and anchored thereto by a cross pin 39 extending through the pintle.

The pintle 38 is rotatably mounted on the upper bearing bracket 11 in coaxial alinement with the pivot pin 23 for the beam supporting member. For this purpose, the bearing bracket is constructed to provide a flat rectangular base 40 having vertically spaced horizontal flanges 41 projecting outwardly from one face. Gussets 42 are provided to strengthen the flanges. Like the base of the lower bearing bracket, the base 40 of the upper bracket is provided with laterally disposed slots for the reception of bolts 43 by which the bracket is secured to the column 7. The flanges 41 are suitably apertured to receive the pintle, the apertures being arranged so that the pintle turns about a vertical axis. Thus both the beam and the stay swing together upon a common axis and the beam is maintained in a substantially horizontal position at all times.

The other end of the stay 10 is secured to the outer end of the beam 5 by the outboard anchoring member 12 previously referred to. As herein shown this member comprises a rectangular metal plate 45 (Figs. 1 and 4) adapted to overlie the upper flange of the beam and having a depending heel piece 46 forming an abutment for the outer end of the beam. The heel piece additionally serves as a stop for the hoist trolley. Projecting from the upper face of the plate 45 are a pair of upstanding ears 47 spaced apart laterally to receive the I-bolt 32 which is anchored thereto by a pintle 48 (Fig. 1) projecting through alined apertures 49 (Fig. 4) in the ears. Flanged clamping members 50 similar to the members 25 removably secured to opposite side edges of the plate as by machine bolts 51 as shown in Fig. 4 serve to clamp the plate to the upper flange of the beam.

To install the crane, the lower bearing bracket 6 is bolted to the column 7 at a point providing the desired overhead clearance for the jib. The only tools required for this purpose are a drill for drilling the holes for the bolts 19 and a wrench for tightening the nuts on the bolts. The upper bearing bracket is similarly bolted to the column above the bracket 6 with the pintle 38 alined coaxially with the pivot pin 23. Due to the adjustable character of the stay and the construction of the parts by which it is anchored, the relative spacing of the upper bracket from the lower bracket is not restricted by the initial dimensions of the jib or the stay. Accordingly, the upper bracket may be located in any convenient position as determined by the conditions prevailing in any particular installation.

The supporting member 8 and stay anchoring member 12 are now secured to opposite ends of the beam 5 by means of the clamping members 25 and 50, respectively. This may be done by simply loosening the bolts 26 and 51 until the members can be slipped over the upper flange of the beam. The bolts are then tightened with a suitable wrench. It is evident that this method of assembling the parts greatly facilitates installation of the crane. Moreover, it permits the use of any available section of beam of approximately the desired length.

Having assembled the beam and associated parts forming the jib of the crane, the assembly is next mounted on the lower bearing bracket by means of the pivot pin 23. The stay 10 may then be connected between the upper bearing bracket 11 and the stay anchoring member to support the outboard end of the jib. Ordinarily, it will be found most convenient to initially attach the inner end of the stay to the pintle 38. This is done by placing the loop 34' of the cable 30 in the slot 37 and inserting the pin 39 therethrough. The I-bolt 32 of the turnbuckle is then secured to the anchoring member by means of the pintle 48. Finally the cable is pulled through the I-bolt 31 until the stay is of the desired overall length. Clamps 34 are then placed over the end of the cable to hold it permanently in place. Fine adjustments are made, when required, by turning the link 33 of the turnbuckle.

It will be apparent from the foregoing that the invention provides a jib crane of novel and improved construction which lends itself readily to shipment in knock-down or kit form. The parts so arranged that the bulkiest part of the crane, that is, the jib, may comprise a length of standard beam thus making it necessary to include this element of the crane in the kit. The

kit is therefore compact, lightweight and inexpensive to ship. Further the parts cooperating with the beam are constructed and arranged for assembly therewith by means of simple tools and without requiring drilling or other machining operations on the beam.

I claim as my invention:

1. A construction assembly for making jib cranes comprising, in combination, upper and lower bearing brackets adapted to be secured to an upright support in vertically spaced relations, a jib supporting member having clamping means operative to frictionally engage the flanges of an I-beam adjacent one end of the beam, a stay anchoring member having clamping means operative to frictionally engage the flanges of the I-beam adjacent the other end of the beam, said clamping means providing the sole connections between the beam and the members, means connecting said supporting member to said lower bearing bracket for pivotal movement about a vertical axis, a stay connectable between said upper bearing bracket and said anchoring member to support the outer end of the beam, and abutments on said supporting member and said anchoring member engageable by the ends of the beam to prevent relative endwise movement of the beam and members.

2. A construction assembly for jib cranes, said assembly comprising, in combination, an upper bearing bracket and a lower bearing bracket adapted to be secured to an upright support in vertically spaced relation, a jib supporting member, a stay anchoring member, means for clamping said members to opposite ends of an I-beam of selected length, means positively connecting said supporting member to the lower bearing bracket for swinging movement in a horizontal plane, and a stay for connecting the upper bearing bracket and said anchoring member so as to support the outer end of the beam, said stay comprising an extensible portion variable in length to accommodate beams of different length, and an adjustable portion for accurately determining the effective length of the stay.

3. A construction assembly for swinging jib cranes, said assembly comprising, in combination, an upper bearing bracket and a lower bearing bracket adapted to be secured to an upright support in vertical spaced relation, a jib supporting member, a stay anchoring member, means associated with said members for clamping them to opposite ends of an I-beam of selected length, means for supporting one end of the beam on said lower bracket including a connection between said supporting member and the bracket permitting pivotal movement of the beam about a vertical axis, an adjustable stay for supporting the other end of the beam from the upper bearing bracket, pintle pins carried by the upper bracket and said anchoring member for connecting the ends of the stay thereto, said pins being horizontally disposed to permit the stay to assume various angular positions as determined by the length of the beam and the spacing of the bearing brackets, and means on the upper bearing bracket supporting the pintle pin thereon for pivotal movement about a vertical axis coincident with the pivotal axis of the beam.

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