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3,396,498

CATHEAD SUPPORTS

Filed March 7, 1967

3 Sheets-Sheet 1

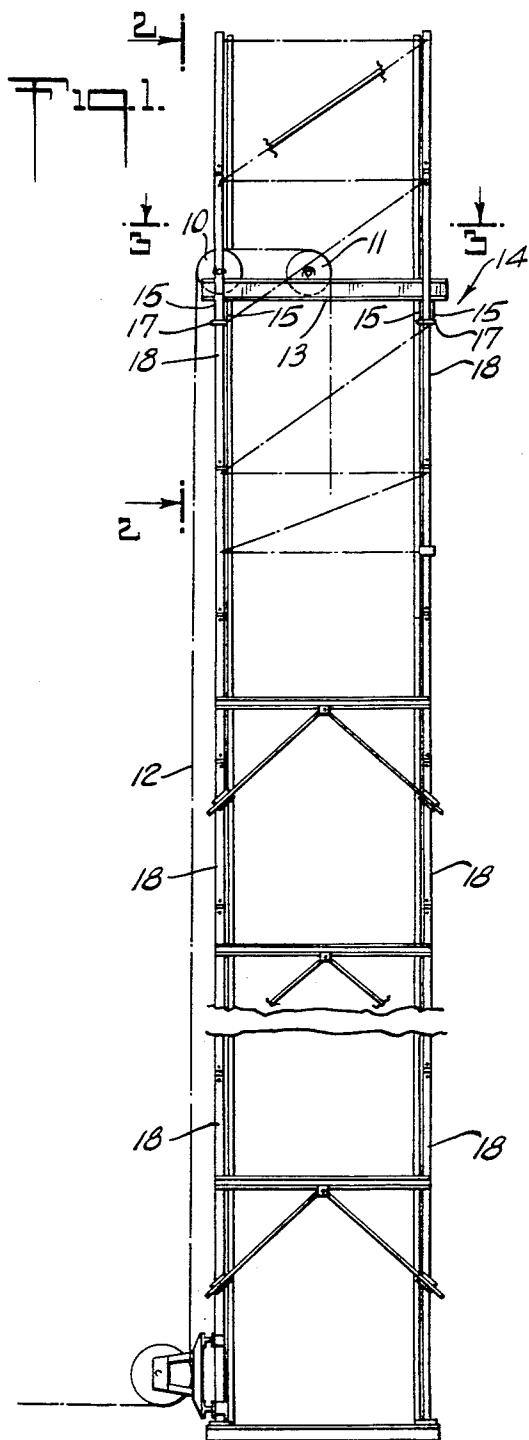
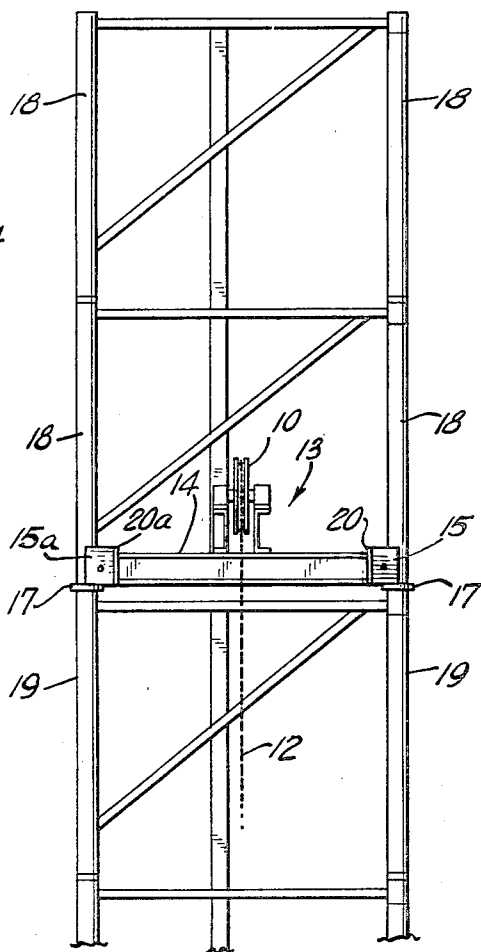


Fig. 2.

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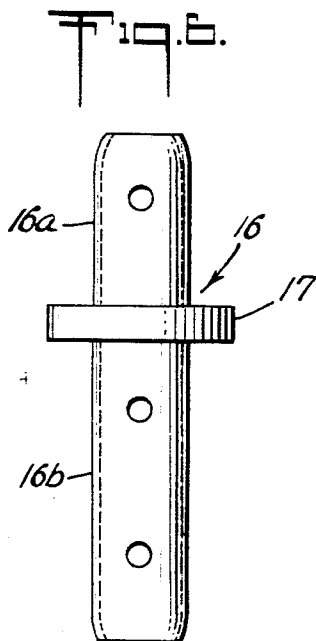
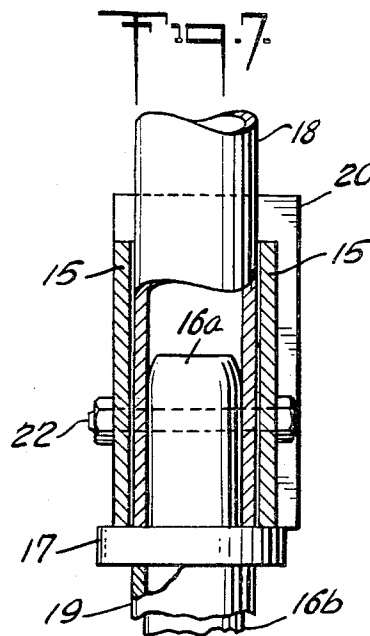
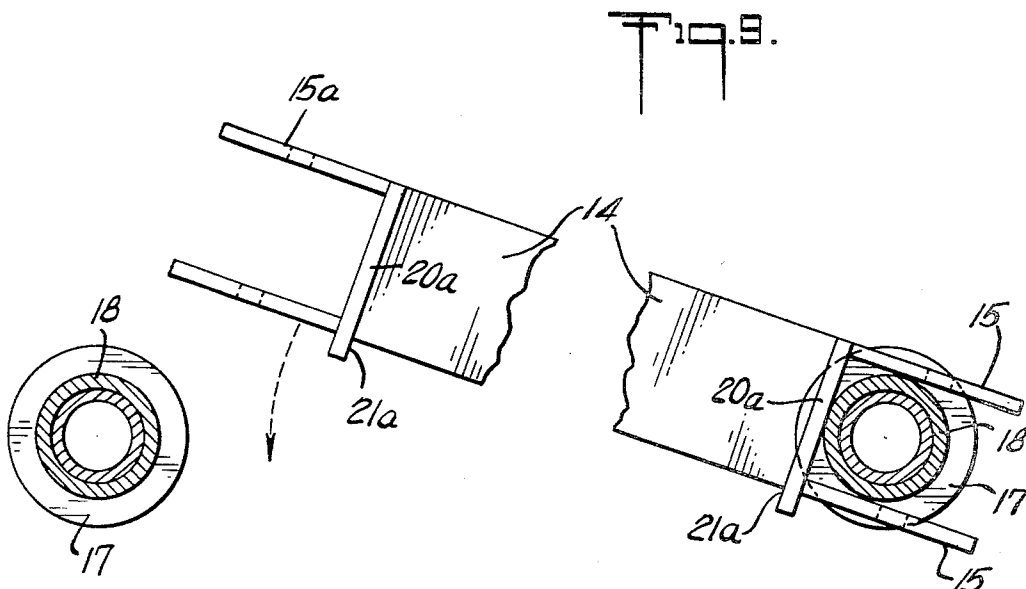
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1

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CATHEAD SUPPORTS

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4 Claims. (Cl. 52—123)

ABSTRACT OF THE DISCLOSURE

A cathead supporting structure for a skeleton panel type tower wherein a hoisting machinery carrier rests on beams which are releasably mounted between uprights or posts of constituent panels at opposite sides of a tower section. End portions of said beams rest on peripheral flanges of "sprockets" or connecting pins interposed between the panel posts of a lower tower section and those of the next higher section. Means are provided for releasably maintaining each beam against displacement in relation to the posts with which the end portions are operatively engaged.

This application is a continuation-in-part of our co-pending application Ser. No. 518,052, filed Jan. 3, 1966.

The present invention relates to cathead supporting apparatus having special utility in the erection and operation of material hoisting towers commonly of tubular metal skeleton construction.

Known types of material hoisting towers employ an element known as a "cathead" which is functionally a carrier or mount for sheaves arranged to support and guide a cable operatively connected to raise and lower a cage or the like within the tower. Ordinarily, such a carrier spans the tower transversely and is removably supported at its ends on beams, one at each side of the tower. Such beams have been relatively heavy as compared to the tubular skeleton frame elements of the tower and have required clamps, bolts, etc. to hold them in position, thus materially increasing the difficulties, time and labor costs in erecting and dismantling the tower structure.

An object of the present invention, among others, is to provide cathead support means which may be adequately strong yet of relatively light weight, which can be employed in the structure and removed at minimal expense of time and labor, and which can readily be moved from one position to another as the erecting or dismantling operations require.

Cathead support apparatus according to our invention is advantageously employed in connection with a hoisting tower, for example, as described and shown in said pending application and comprising in general a vertical array of substantially similar superimposed sections advantageously of prefabricated two dimensional units or panels.

Each of these may conveniently include a tubular post or upright, a sleeve, and appropriate converging transverse and diagonal braces connecting said post and sleeve to form a unit of generally triangular plan. In a typical tower section incorporating these units opposite side panels thereof are assembled on the job and interconnected by an end panel. Panels of one of these sections are releasably joined at the section corners to panels of vertically adjacent sections by adapters, or "sprockets," which are, in effect, connecting pins each conveniently including an elongated shank and, at an intermediate portion thereof, a coaxial peripheral flange. Thus, in operation, each said flange rests on top of the post of a lower panel with the lower end of the sprocket shank, i.e., below said flange, extending or telescoping into the open end of said lower panel post while the upper end of said shank,

2

i.e. above said flange, extends or telescopes into the open lower end of a coaxially related post of the next higher panel.

In practice, the relatively light transverse braces of the panel units are not designed to sustain substantial loading across their midportions, so that more rugged transverse elements, as structural beams are required to support the cathead and the operating parts and loads carried thereby.

In general, our invention resides in cathead supporting apparatus comprising a structural beam removably mounted between the spaced uprights or posts of a tower section and having at each end a pair of terminal longitudinally extending arms, end portions of which embrace portions of said posts and rest in operative position on a bearing provided by a peripheral flange extending radially from an intermediate portion of a connecting pin the ends of which are operatively telescoped, respectively, in the opposed open ends of coaxially arranged posts. Means are included for releasably securing the ends of said beam to said posts and thus holding it in operative cathead sustaining position.

Other objects and distinctive features of our invention will appear in the following specification, claims and appended drawings wherein we have described, claimed and illustrated a preferred embodiment of said invention thereby to aid others in understanding its principles so that they can practice it in any manner best suited to the conditions of a particular use.

In said drawings:

FIGURE 1 is a building side or end elevation of a portion of a hoisting tower showing cathead supporting devices operatively interposed, in effect, between vertically adjoining tower sections.

FIGURE 2 is a side elevation of a portion of the tower of FIGURE 1, with elements of the cathead and its supporting apparatus shown on enlarged scale.

FIGURE 3 is a transverse section from the line 3—3 of FIGURE 1.

FIGURE 4 is a detail on enlarged scale in transverse section showing the removable transverse beam and its connection with the posts or uprights of a tower.

FIGURE 5 is a fragmentary detail on enlarged scale in vertical section from the line 5—5 of FIGURE 4.

FIGURE 6 is a detail view in elevation of one form of connecting pin or "sprocket" conveniently usable as a vertical interconnection between coaxially arranged posts of vertically adjoining tower panels and as a bearing for supporting the ends of the transverse beams seen in FIGURES 3 and 4.

FIGURE 7 is a fragmentary view on enlarged scale and partly in central vertical section showing one end of the transverse beam, FIGURE 4, resting on the flange of a connecting pin of the kind shown in FIGURE 6 and releasably secured to one of the posts.

FIGURE 8 is a view in perspective of the transverse beam portions of which are shown in FIGURES 3, 4 and 5.

FIGURE 9 is a top plan view with parts broken away and parts in horizontal section showing a structural beam as initially positioned for placement in the tower structure.

Referring to the drawings, an embodiment of our invention includes a cathead assembly wherein sheaves 10 and 11, and cable 12 are mounted on a cathead carrier beam 13 which, as seen in FIGURE 2, may advantageously comprise spaced channel beams with said sheaves 10 and 11 mounted to rotate between them. End portions of the carrier beams rest on intermediate parts of transverse structural beams 14, FIGURE 8, one at each side of the tower section in which the cathead is to be located. To attain the desired advantages in use and

handling, each beam 14 is provided at its ends with pairs of terminal longitudinally extending arms 15, 15a arranged with their outer end portions spaced apart and each pair forming in effect a terminal yoke.

To provide temporary supporting elements in the tower structure for each such structural beam 14, two connecting pins, or "sprockets" 16, FIGURES 4, 6 and 7, are mounted therein at the desired level, each having an upper shank portion 16a, a lower shank portion 16b and a peripheral flange 17 between said shank portions. One such pin having the peripheral flange 17, for example, is positioned in use, FIGURE 7, with its upper shank portion 16a shown dotted telescoped in the lower end of a tubular post 18 and its lower shank portion 16b telescoped in the top end of the tubular post 19 of a lower tower section. This arrangement is such that flange 17 rests on the top edge of post 19; and the bottom edge of post 18, FIGURE 5, rests on the top surface bearing of flange 17. As seen in FIGURE 5, the bearings provided by flanges 17 also support the yokes or arms 15, 15a and hence the structural transverse beams 14 which between them support composite beam 13 of the cathead carrier.

As indicated in FIGURES 5 and 8, the arms 15, 15a at the ends of beams 14 are connected as by welding to cross plates 20, 20a advantageously secured by welding to the ends of said beam. It is noted that the bottom edge of each cross plate 20, 20a is substantially flush with the bottom edges of the arms 15, 15a secured thereto and that the plane of said bottom edges is offset downwardly from the plane of the bottom surface of beam 14. Also, the inner edge as 21, 21a, of each plate 20, 20a, FIGURE 3, extends laterally beyond the inner edges of beam 14; and, as seen in FIGURES 5 and 8, the top edges of plates 20, 20a extend above the plane of the top surface of beam 14. When said beam 14 is in operative position with its end arms supported on flanges 17 and spanning posts 18, it is conveniently releasably secured in operative position, as by bolts 22 operatively engaging said yoke arms 15, 15a.

When it is desired to incorporate a cathead and supporting apparatus embodying the present invention at a given level in a hoisting tower as above described and wherein the superimposed sections of the skeleton structure have reached that level, the lower ends of said connecting pins 16 are inserted, i.e., telescoped in the open top ends of the corner posts. It is noted that, for this special purpose, the flanges of these pins 16 are advantageously wider than the flanges of pins employed primarily in connecting vertically adjoining sections wherein no cathead is to be mounted.

With pins 16 in place, the panels of the next higher section are erected. This brings posts 18 of such a section into the positions as seen in FIGURE 2. To emplace a beam 14, it is brought initially to a position with said spaced arms 15 at one end, right, for example, FIGURE 9, embracing post 18, with their bottom edges resting on the top or bearing surface of a flange 17 and with the outer face of plate 20 bearing against post 18. The left end of beam 14 is now at one side of the opposite post 18 which is to be engaged by yoke arms 15a. To bring said yoke arms into operative relation to post 18 and flange 17 at the left, FIGURE 4, the left end of beam 14 is deflected or swung sufficiently in a direction such that arms 15a come into a position to straddle post 18 and rest on flange 17. Beam 14 is now moved axially to the left sufficiently to reposition plates 20, 20a in substantially equi-spaced relation to posts 18, or so that bolts 22 may be passed through the opposed holes in arms 15 and 15a, respectively, and secured with their shanks extending between the posts 18 and opposed faces of said plates 20 and 20a, FIGURE 4. This arrangement in effect provides a yoke at each end of beam 14 and at the same time bolts 22 cooperate with posts 18 to limit endwise displacement of the beam from its operative cathead supporting position.

In a case where the cathead assembly is to be moved to a higher level in the tower, similar preparatory placing of another set of pins 16 and beams 14 will take place at the desired higher level. The bolts connecting the yoke arms at each end of each beam 14 will be removed, and said beam will be displaced endwise to the right, for example, so that the arms 15a at the opposite end may be disengaged from post 18 after which arms 15 will also be freed from opposite lower level post. Said beams are now conveniently repositioned at the higher level with said yoke arms resting on the flanges of another set of pins and straddling a higher placed pair of posts, said first set of pins advantageously being left in position for convenience in case the cathead is later to be shifted to that lower position in the tower.

We claim:

1. Cathead support structure for hoisting towers of the type wherein an array of vertically adjoining sections each include side and end panels and each panel constituting an integral unit comprising an upright tubular post at one side, a sleeve at the opposite side, a transverse brace and a diagonal brace connecting said post and said sleeve, said support structure including at the level between sections in the tower two connecting pins each having a shank and a flange extending radially from an intermediate portion of its shank, the upper end of the shank of one of said pins being engaged coaxially in the lower end of a post of a next higher panel and the lower end of said shank being engaged coaxially in the upper end of the post of the lower panel adjoining said higher panel, said flange of said first pin being positioned to rest on the upper end of the post of said lower panel and to support the lower end of the post of said higher panel, the upper end of the shank of the other of said pins being engaged coaxially in the lower end of the post of another vertically adjoining higher panel and the lower end of the shank of said other of said pins being engaged coaxially in the sleeve of one lower panel and in the upper end of the post of another panel in the same tower section, said flange of the second mentioned pin being positioned to rest on the upper end of the sleeve of said lower panel and to support the lower end of the post of a higher panel in another section of the tower, and a structural beam provided with end yokes each comprising spaced arms extending longitudinally from its opposite ends, said yokes being positioned to rest on the flanges of said pins and to embrace vertical lower end portions of posts of laterally adjoining panels in the same section, and means cooperating with said yokes and arranged and adapted to releasably secure said beam in operative cathead supporting position between the posts of said laterally adjoining panels.

2. Apparatus according to claim 1 and wherein said beam supporting means includes a stop member releasably supported on and extending between the opposed arms of each yoke and in operative relation to said posts to limit endwise displacement of the beam.

3. Cathead supporting structure for use in hoisting towers of the type wherein laterally interconnected component panels are arranged in an array of vertically adjoining and interconnected tower sections, each said panel including a vertical tubular post, two connecting pins each operatively engaged coaxially in vertically adjoining posts and each having a peripheral flange interposed between the bottom end of the post of a higher panel and the top end of a post of a lower panel and extending radially beyond said posts to provide a bearing coaxial therewith, a structural beam removably mounted between said pins and having spaced arms extending longitudinally beyond its opposite ends and positioned with end portions resting on said bearings, and means operatively engaged between said beam and said posts to releasably secure the beam in operative cathead supporting relation to said bearings and posts.

4. Cathead supporting apparatus for hoisting towers having spaced upright posts and including a structural

5

beam having laterally spaced arms providing yokes having open end portions secured to and extending longitudinally axially beyond its opposite ends, and means operatively arranged and releasably securing said open end portions of said yokes in straddling relation to said posts and to limit endwise displacement of the beam in relation to said posts, said means including stop members removably supported on and extending transversely between the arms of said yokes and operatively positioned axially between said posts and said opposite ends of the beam, means supporting said beam on said posts independently of said stop members.

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