Feb. 17, 1948. C. A. LUNDEEN 2,435,972

PIPE TONG SUPPORT

Filed March 20, 1945

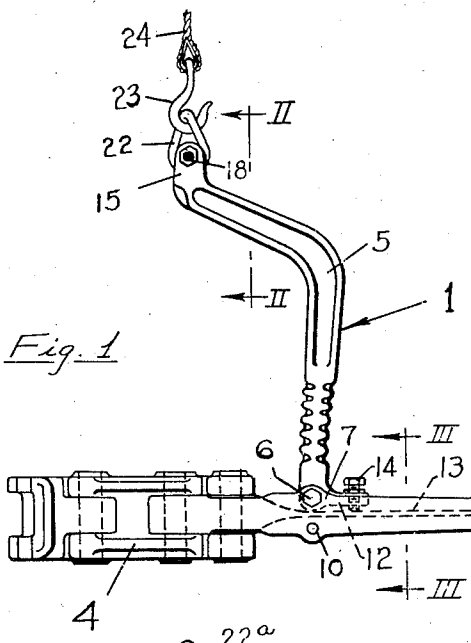


Fig. 1

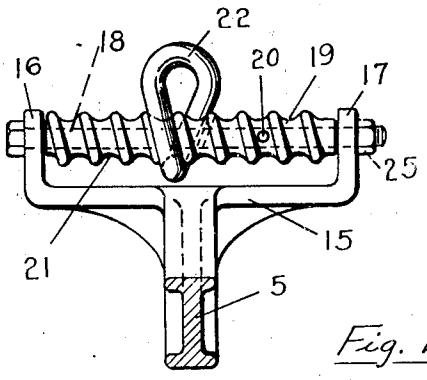


Fig. 2

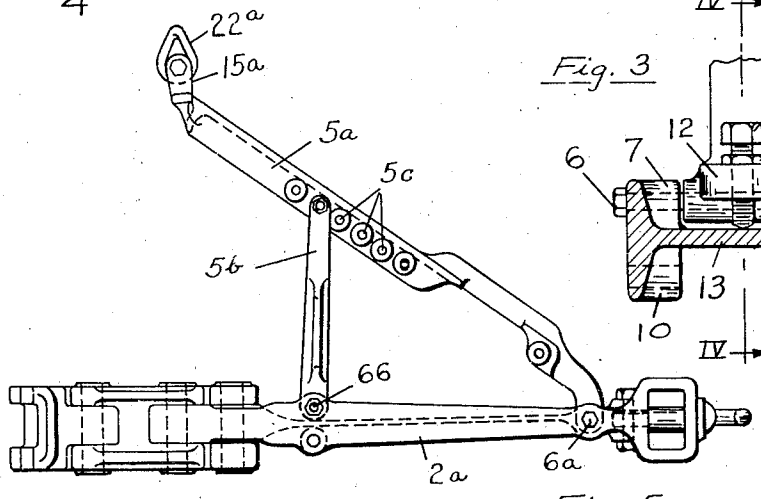


Fig. 5

Fig. 3

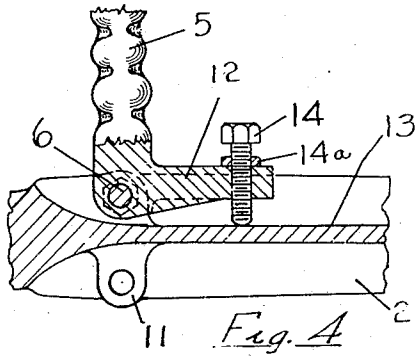


Fig. 4

Inventor

Chester A. Lundeen

By Lyon & Lyon

Attorneys

Patented Feb. 17, 1948 2,435,972

UNITED STATES PATENT OFFICE

2,435,972

PIPE TONG SUPPORT

Chester A. Lundeen, Los Angeles, Calif., assignor to Byron Jackson Co., Vernon, Calif., a corporation of Delaware

Application March 20, 1945, Serial No. 583,790

4 Claims. (Cl. 255—35)

1

This invention relates generally to pipe tong supports, and particularly to hanger structures by which drill pipe tongs and casing tongs are suspended in a well derrick.

It is customary to suspend each well pipe tong from one end of a wire line trained over a sheave in the upper portion of the derrick and having a counterweight attached to its other end. This mode of suspension offers a minimum of interference with manipulation of the tong when in use, and permits its being swung clear of the working space on the derrick floor when not in use. It is important that the tong be suspended in a horizontal position, in both longitudinal and transverse directions, in order to align the pipe recess in the tong head with the pipe joint to which it is to be applied. It is therefore necessary to attach the tong to the suspension line at a point directly above the center of mass of the tong. Inasmuch as it is customary to provide interchangeable jaws of different sizes to enable the tong to be applied to a wide range of pipe sizes, the center of mass of the tong cannot be considered as fixed, but, on the contrary, is shifted both longitudinally and laterally of the tong when the jaws are interchanged.

For the foregoing reason, it has heretofore been proposed to provide a hanger structure for attaching a well pipe tong to a suspension line, wherein means are provided for shifting the point of connection of the suspension line to the hanger structure. An example of a hanger of this type is shown in Patent No. 2,313,743, granted March 16, 1943, to Herbert E. Grau and Chester A. Lundeen, wherein a hanger arm is pivotally attached to the tong lever at its outer, lower extremity and is adjustable about its pivot to move its upper, inner extremity into different positions spaced apart longitudinally of the lever. The upper, inner extremity of the arm is provided with a series of transversely spaced sockets adapted to be selectively engaged by the usual hook on the end of the suspension line. With this type of hanger it is necessary to relieve the hanger of the weight of the tong when changing the adjustment of the suspension point. This is not entirely satisfactory inasmuch as the selection of the proper adjustment is arrived at by trial and error.

It is a principal object of this invention to provide a hanger structure for well pipe tongs which may be adjusted while the tong is suspended in working position.

A further object is to provide a tong hanger which permits adjustments of the suspension

2

point both longitudinally and transversely of the tong, both adjustments being possible while the tong is suspended in working position.

A still further object of this invention is to provide a tong hanger incorporating means for adjusting the suspension point in infinitely small increments while the tong is suspended in working position.

A still further object of this invention is to provide a tong hanger of simple and sturdy construction and incorporating novel and improved adjusting means.

Other objects and advantages will be apparent from the following detailed description of a preferred embodiment of the invention and a modification thereof, reference being had to the accompanying drawing wherein:

Fig. 1 is a view in side elevation of a tong and hanger structure embodying the invention;

Fig. 2 is an enlarged end elevation of the upper portion of the hanger of Fig. 1, taken substantially on line II—II of Fig. 1 and showing the transverse adjusting means;

Fig. 3 is an enlarged vertical section taken on line III—III of Fig. 1, showing in end elevation the means for adjusting the hanger arm about its transverse pivotal axis;

Fig. 4 is a fragmentary sectional view taken on line IV—IV of Fig. 3; and

Fig. 5 is a view in side elevation of a modified type of hanger embodying the novel transverse adjusting means.

Referring to Figs. 1 to 4 of the drawing, my novel hanger, generally designated 1, is shown as applied to a drill pipe and casing tong similar to that illustrated in Figs. 11 and 16 of the aforementioned Patent No. 2,313,743, and comprises generally a lever 2 having clevis means 3 at its outer end for the attachment of a tong line thereto, and having a series of interconnected jaws forming a tong head 4 attached to the inner end of the lever. The center of mass of such a tong is usually approximately at the inner extremity of the lever, although its position varies several inches both longitudinally and transversely of the lever, depending on the particular size of jaws employed in the head.

The hanger 1 of this embodiment of the invention comprises a one-piece arm 5 pivotally connected at its lower end to the lever by a transverse pivot pin 6 extending through a pair of laterally spaced bosses 7 and 8 on the lever (Fig. 3) and through a boss 9 formed on the lower end of the hanger arm. Similar bosses 10 and 11 are also provided on the under side of the

lever to permit the attachment of the hanger to the lever when the tong is inverted to convert it from a right-hand to a left-hand tong or vice versa. Formed integral with the arm 5 adjacent its lower extremity is a rearwardly projecting boss 12 which overlies the central web section 13 of the tong lever. The boss 12 is drilled and tapped to receive an adjusting screw 14 which may be adjusted in the boss 12 to variably limit the counterclockwise pivotal movement of the tong relative to the hanger about the axis of the pivot pin 6. It will be understood that inasmuch as the center of mass of the tong is located to the left of the pivot pin 6, as viewed in Fig. 1, the tong tends to tilt in a counterclockwise direction, tending to dispose the center of mass directly beneath the axis of the pivot pin. Consequently, the web portion 13 of the lever always exerts pressure against the adjusting screw 14. By varying the adjustment of the screw 14, the upper extremity of the arm 5 may be adjusted longitudinally of the lever to move the suspension point into different positions corresponding to longitudinal shifting of the center of mass when the jaws are interchanged. The adjusting screw may be locked in adjusted position by a lock nut 14*a* or other suitable means.

It will be observed that the arm 5 comprises an upright portion and an upper, inwardly inclined portion, the purpose of which is to dispose the upper extremity thereof above the center of mass of the tong and at the same time to provide working clearance for the other tong head when the instant tong is applied to the lower section of a pipe joint.

Referring now particularly to Fig. 2, the upper extremity of the arm 5 is provided with a transversely elongated head 15, at the opposite extremities of which are upstanding yoke arms 16 and 17 having aligned bores in which a bolt 18 is supported. A spool-like sleeve 19 is mounted on the bolt intermediate the yoke arms 16 and 17, being secured thereto in any suitable manner such as by a transverse pin 20. The peripheral surface of the sleeve is provided with a continuous helical groove 21 with which a twisted link 22 is adapted to be threadedly interlocked. The link serves as a means of attaching the hanger to the usual hook 23 secured to the lower end of the tong suspension line 24 (Fig. 1). It will be obvious that upon loosening the nut 25, the bolt 18 may be rotated by a wrench applied to the bolt head, thereby rotating the sleeve 19 to adjust the position of the link 22 axially of the bolt. By reason of this threaded adjustment means, it is thus possible to adjust the suspension point by infinitely small increments to obtain perfect balance of the tong in a transverse direction. Perfect balance of the tong in the longitudinal direction of the lever is also rendered possible by adjustment of the adjusting screw 14 to shift the suspension point by infinitely small increments in that direction.

Obviously, the "spool-type" transverse adjusting means shown in Fig. 2 may be employed in conjunction with other forms of hanger structure embodying longitudinal adjustment means different from that illustrated in Figs. 1, 3 and 4. In Fig. 5 there is shown, for example, a hanger structure of the type disclosed in Figs. 11 to 16 of the aforementioned Patent No. 2,313,743, but having incorporated therein a head structure 15*a* substantially identical with the head 15 of Fig. 2, and having similar threaded adjusting means for the link 22*a*. The hanger arm 5*a* of this

construction is pivotally connected to the lever 2*a* at 6*a* adjacent the outer end of the lever, and is held in any one of several adjusted positions by an arm 5*b* pivotally connected at its lower end to the lever at 6*b* and adapted to be selectively connected at its upper end to the arm 5*a* at any one of several points 5*c* spaced apart lengthwise of the arm 5*a*.

From the foregoing description of a preferred embodiment of the invention and a modification thereof, it will be apparent that I have provided a hanger structure for well pipe tongs which has numerous advantages, the most outstanding of which are its susceptibility to adjustment by infinitely small increments, its susceptibility to adjustment while supporting the weight of the tong, and the ease with which the adjustment may be effected.

It is to be understood that the invention is not limited to the specific construction shown and described, and that various modifications in construction and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A hanger structure for a pipe tong, comprising: a supporting member having means for attaching it to a tong; and means for adjustably connecting the supporting member to a suspension member, said adjustable connecting means including an element rotatably carried by said supporting member and having an external helical groove, and a second element connected to said suspension member and supporting said supporting member by engaging in said groove, said first element being rotatable to effect axial movement of said second element and suspension member relative to said supporting member upon relative rotation between said elements.

2. A hanger structure for a pipe tong, comprising: a hanger arm adapted to be connected adjacent its lower end to a pipe tong and having a pair of horizontally spaced ears adjacent its upper end; an elongated member rotatably supported by said ears adjacent its ends and having the portion thereof between said ears helically grooved; a second member supporting said hanger arm by being engaged in the grooved portion of said elongated member and interlocked therewith for adjustment axially thereof upon rotation of said elongated member; means for locking said elongated member against rotation to secure said second member in a selected position axially of said elongated member; said second member being adapted to be connected to suspension means.

3. In a pipe tong: a tong head; a lever extending laterally therefrom; and a hanger structure comprising a rigid supporting arm and pivot means securing one end thereof to the lever for pivotal movement relative thereto about a fixed transverse axis; means adjacent the free end of said arm for connecting suspension means thereto; and means threadedly connected to said arm laterally of said pivot means and engageable with said lever to adjustably limit the pivotal movement of the arm relative to the lever in one direction.

4. A hanger structure for pipe tongs of the type having a relatively heavy head and a relatively light handle lever extending therefrom, wherein the hanger structure suspends the pipe tong with its center of gravity in substantial coincidence with the axis of a suspension line to dispose said tong head in position for engag-

ing a vertically directed pipe, said handle lever extending horizontally therefrom, said hanger structure comprising: a suspension beam attached to said handle lever, angularly adjustable relative thereto and extending therefrom in a vertical plane through said handle to a point approximately coinciding with a vertical line passing through the resultant center of gravity of said pipe tongs and beam; a helical member at the extremity of said beam, said member being rotatably adjustable about an axis normal to the plane defined by said handle lever and beam; a coacting suspension ring engageable with said helical member and supported from said suspension line for movement upon adjustment of said helical member laterally relative

to said plane to compensate for lateral displacement of the center of gravity of said beam and tong.

CHESTER A. LUNDEEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,237,427	Grau	Apr. 8, 1941
2,302,998	Martin	Nov. 24, 1942
2,313,743	Grau et al.	Mar. 16, 1943
1,649,904	Longgood	Nov. 22, 1927