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OIL WELL MAST CROWN BLOCK

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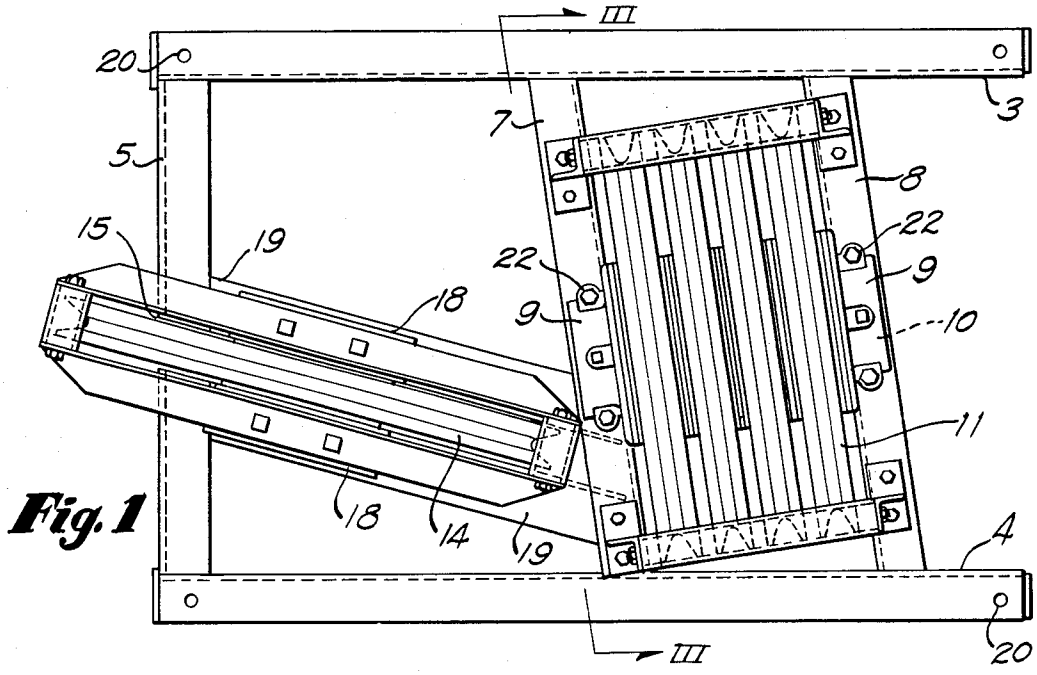


Fig. 1

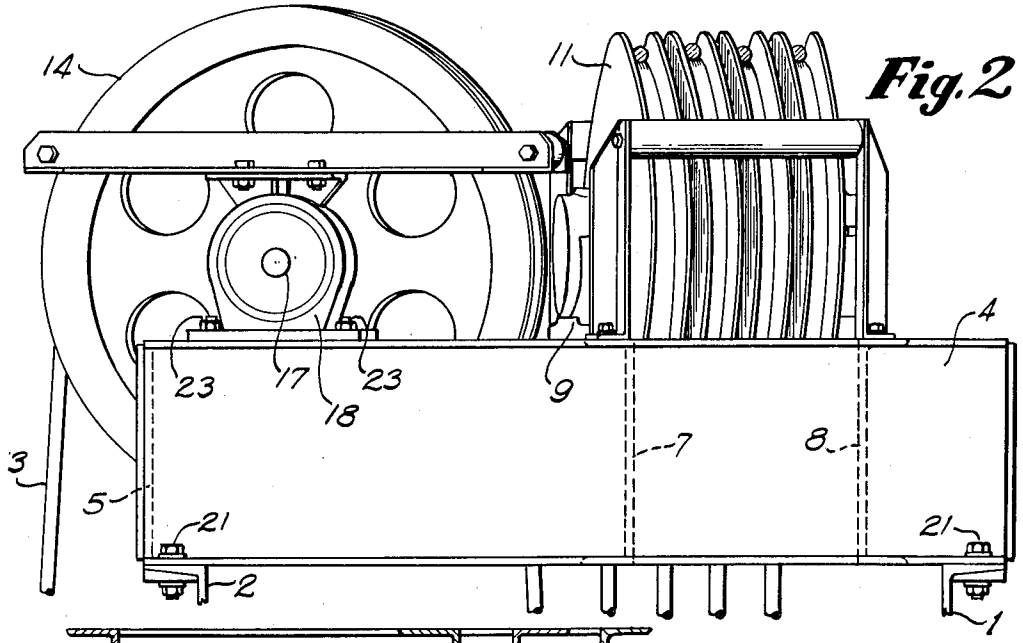


Fig. 2

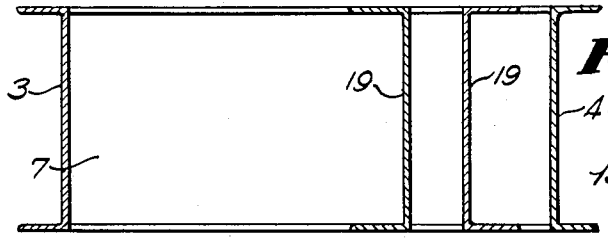


Fig. 3

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OIL WELL MAST CROWN BLOCK

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This invention relates to oil well mast crown blocks, and more particularly to those containing a set of parallel sheaves and a separate fast sheave.

It is among the objects of this invention to provide a crown block which keeps at a minimum the maximum flight angle of the fast line with the drawworks, which supports the traveling block square with the mast, and which allows the dead line to be anchored to either the right or left hand side of the mast.

In accordance with this invention, a cluster or set of parallel sheaves is disposed in a horizontal frame where a horizontal shaft extends through the sheaves. The shaft is detachably supported on the frame with its axis oblique to the side of the frame nearest the drawworks. Also disposed in the frame is a vertical fast sheave that extends from the cluster outward beyond the drawworks side of the frame. The fast sheave is detachably supported on the frame obliquely to that side, and the outer end of the sheave is located near the center of the drawworks side. The fast sheave is skewed in the frame in the same general direction as the set of sheaves, but to a much greater extent, the set of sheaves being skewed only enough for the traveling block to hang square in the mast. The top and bottom of the crown block frame are alike so that when necessary the frame can be inverted and the sheaves mounted on the opposite side. This arrangement permits the sheaves to be mounted either right or left hand relative to the frame, depending upon whether the dead line is to be anchored at the right or left hand side of the mast.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

Fig. 1 is a plan view of our own crown block;

Fig. 2 is a side view indicating the positions of the lines, and

Fig. 3 is a vertical cross section through the crown block frame alone, taken on the line III—III of Fig. 1.

Referring to the drawings, a generally rectangular crown block frame is secured to the front and rear top beams 1 and 2 of an oil well mast. The frame includes parallel side beams 3 and 4 of channel form having a cross beam 5 connected to their rear ends to form the rear side of the frame. The front side of the frame is shown open, but it may be closed by a cross beam if desired. The rear side of the frame is closest to the usual drawworks (not shown) at the back of the mast and therefore is referred to herein as the drawworks side of the frame. The central and front portions of the side beams are connected by a pair of parallel cross members 7 and 8, likewise of channel form, which are skewed relative to the side beams. Mounted on the central portions of these cross members are a pair of shaft supports 9, in which the opposite ends of a horizontal shaft 10 are rigidly mounted. A set of sheaves 11 is journaled on the shaft between the cross members. The center of the shaft is located above the center of the well, and the axis of the shaft is oblique to cross beam 5 at the drawworks side of the frame. The shaft and sheaves are skewed at such an angle in the frame that the lines suspended from the sheaves will

support the traveling block (not shown) square with the mast in a well-known manner; that is, the axis of the sheaves in the traveling block will be parallel to the opposite sides of the mast, which is the position in which the block occupies the least space.

To lead the fast line 13 (Fig. 2) from the drawworks to the crown block, a fast sheave 14 is provided that extends from the set of sheaves 11 outward through a vertical slot 15 through the rear cross beam 5 of the frame. The fast sheave is journaled on a shaft 17 mounted in supports 18 which are fastened to the tops of a pair of spaced parallel intermediate channel members 19 secured at their ends to the rear cross beam on opposite sides of the slot and to the central cross member 7. The intermediate members and the fast sheave are disposed oblique to the cross beam of the frame. The fast sheave is skewed in the frame in the same general direction as the other sheaves, but to a much greater extent. That is, as viewed in Fig. 1, all of the sheaves are inclined to the left. The outer edge of the fast sheave is located near the longitudinal center line of the crown block, and the inner edge of the fast sheave is located near that end of the central cross member 7 which is farthest from the rear cross beam of the frame.

With the arrangement of sheaves just described, the fast line from the drawworks extends up to the crown block and first engages fast sheave 14 at a point substantially on the longitudinal center line of the crown block. As the line travels back and forth on the drawworks drum, the flight angle between the line and the drum will be the same at both ends of the drum, instead of being small at one end and great at the opposite end. Undue wear of the line as it is coiled and uncoiled on the drum thereby is avoided.

The fast line runs from outside the mast over the fast sheave and then down to the traveling block and then up to the sheave 11 nearest to central cross member 7. The line passes over that sheave and down to the traveling block again and then back up to sheaves 11. This is continued until the line is dead ended at the side of the mast at which it leaves the front sheave.

A feature of this invention is that all of the beams, cross members and intermediate members forming the crown block frame have the same depth, so that their upper and lower surfaces lie in two parallel horizontal planes. Consequently, the top of the frame has the same appearance, whichever side of it is up, except that the cross members and the intermediate members will be disposed in right or left hand relation to the crown block, depending upon the side of the frame that is uppermost. The upper and lower flanges of side beams are provided at their ends with bolt holes 20, so that the side that is down can be fastened to the top of the mast by bolts 21. The shaft supports 9 are fastened down to the underlying supporting members 7 and 8 by bolts 22 (Fig. 1) while shaft supports 18 are detachably connected to intermediate members 19 by bolts 23 (Fig. 2). The lower flanges of these four members are provided with bolt holes in line with the bolts above, so that if the frame is inverted the shaft supports can be bolted to the other side. Consequently, no matter which side of the frame is uppermost, the shaft supports can be bolted to the top of it. Of course, when the frame is inverted the sheaves are disposed opposite hand to what their position would be if the frame were the other side up. This permits the sheaves to be mounted for anchoring the dead line to either the right or left hand side of the mast, which usually is not known by the manufacturer at the time he supplies the crown block. Thus, not only are common parts used for right or left hand assembly of the crown block, but also the arrangement can be changed readily at the user's choice.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. An oil well mast crown block comprising a horizontal frame having a drawworks side, a set of parallel sheaves in the frame, a horizontal shaft extending through the sheaves, means supporting the shaft on the frame with its axis oblique to said side of the frame, a vertical fast sheave in the frame extending from said set of sheaves outward beyond the drawworks side of the frame, and means supporting the fast sheave on the frame obliquely to said side with the outer edge of the sheave near the center of that side, the fast sheave being skewed in the frame in the same general direction as said set of sheaves but to a much greater extent.

2. A crown block as defined in claim 1, in which said drawworks side of the frame is provided with a vertical slot, through which the fast sheave extends.

3. A crown block as defined in claim 1, in which said supporting means are detachably connected to said frame, and the top and bottom of the frame are alike so that in case the frame is inverted said supporting means can still be mounted on it, whereby the sheaves can be disposed either right or left hand relative to the frame.

4. A crown block as defined in claim 1, in which the frame includes a pair of spaced parallel cross members extending across it and supporting said shaft supporting means, and a pair of spaced parallel intermediate members secured at their ends to said drawworks side of the frame and to the nearest cross member and supporting said fast sheave supporting means.

5. A crown block as defined in claim 4, in which the top and bottom of said members are substantially flush with the top and bottom of the sides of said frame and are provided with vertical holes for connection to said supporting means, regardless of which side of the frame is up.

6. A crown block as defined in claim 4, in which said drawworks side of the frame is provided with a vertical slot extending entirely therethrough and communicating with the space between said intermediate members.

7. A crown block as defined in claim 4, in which said members are disposed at the same angles as the sheaves they support.

8. An oil well mast crown block comprising a horizontal invertable frame having a drawworks side, the frame being provided with a pair of spaced parallel cross members extending across it and a pair of spaced parallel intermediate members secured at their ends to said drawworks side and to the nearest cross member, a set of parallel sheaves between said cross members, a horizontal shaft extending through the sheaves, means on the ends of the shaft detachably mounted on top of said cross members in positions to support the shaft with its axis oblique to the drawworks side of the frame, a vertical fast sheave between said intermediate members and extending outward beyond said drawworks side, a horizontal shaft extending through the fast sheave, and means on the ends of the fast sheave shaft detachably mounted on top of said intermediate members in positions to support the fast sheave obliquely to said side of the frame with the outer edge of the sheave near the center of that side, the fast sheave being skewed in the frame in the same general direction as said set of sheaves but to a much greater extent, and the bottoms of said members being formed to receive and support said shaft-supporting means if it is desired to use the frame bottom side up.

9. A crown block as defined in claim 8, in which said members are provided with upper and lower horizontal flanges having vertically aligned bolt holes therethrough, the crown block including bolts for fastening said shaft-supporting means to whichever flanges are uppermost.

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