Sept. 1, 1931. L. J. BLACK 1,821,788

CROWN BLOCK SHEAVE ASSEMBLY

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Fig. 1.

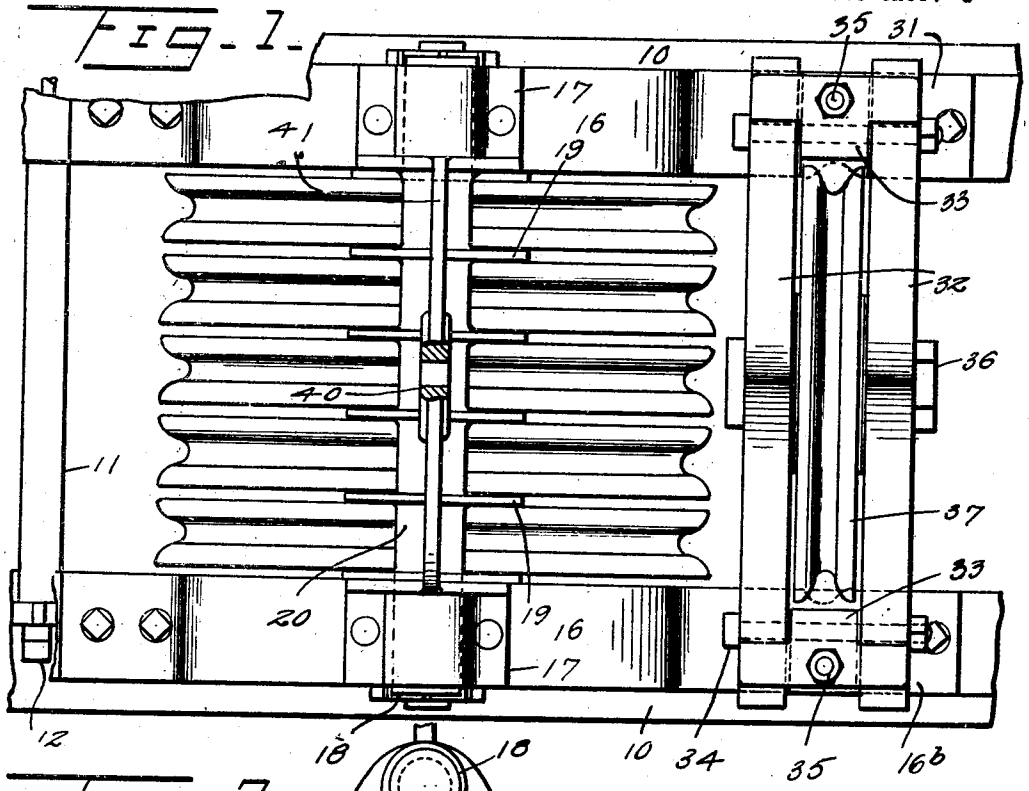
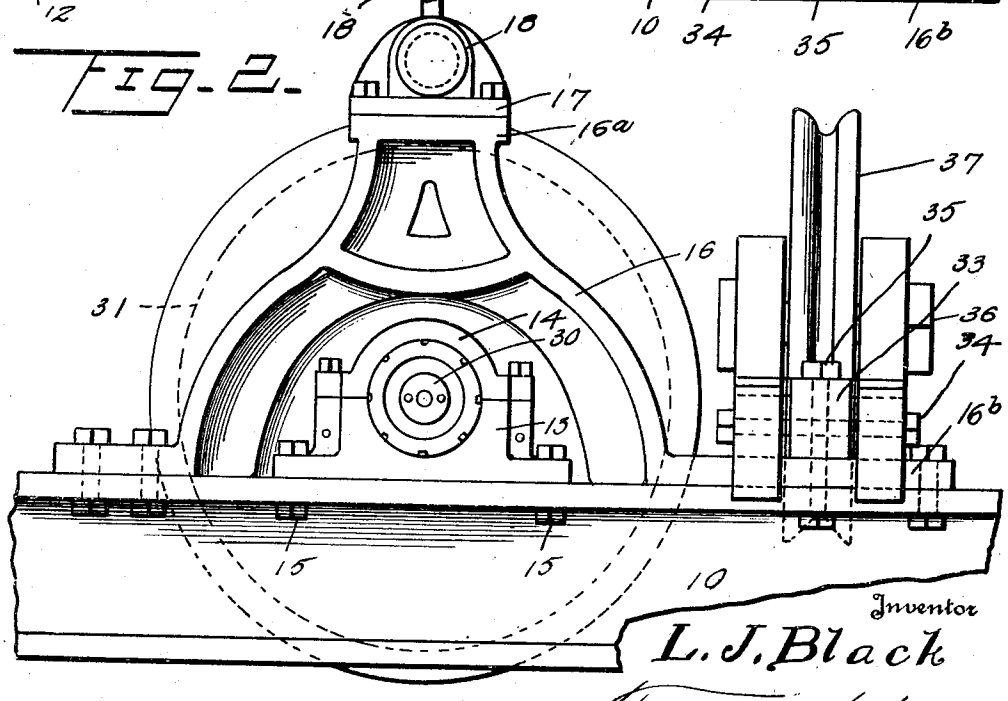


Fig. 2.



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Fig. 4.

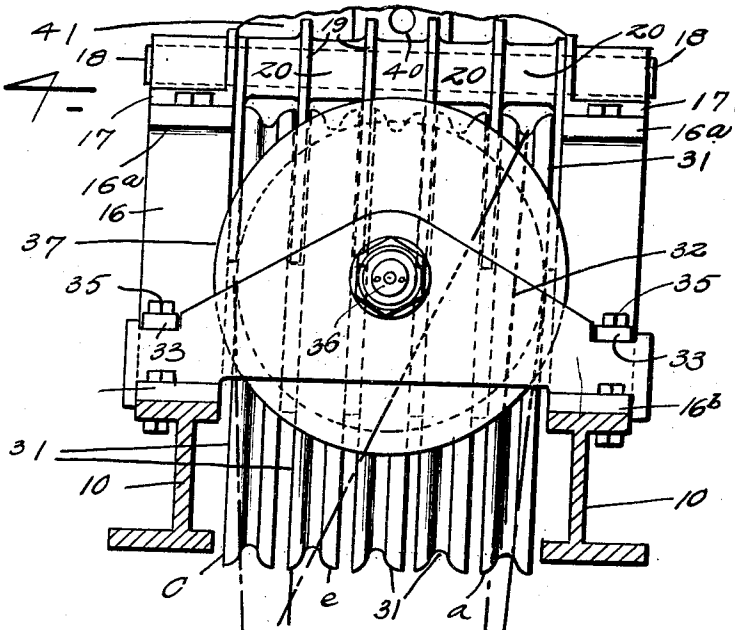
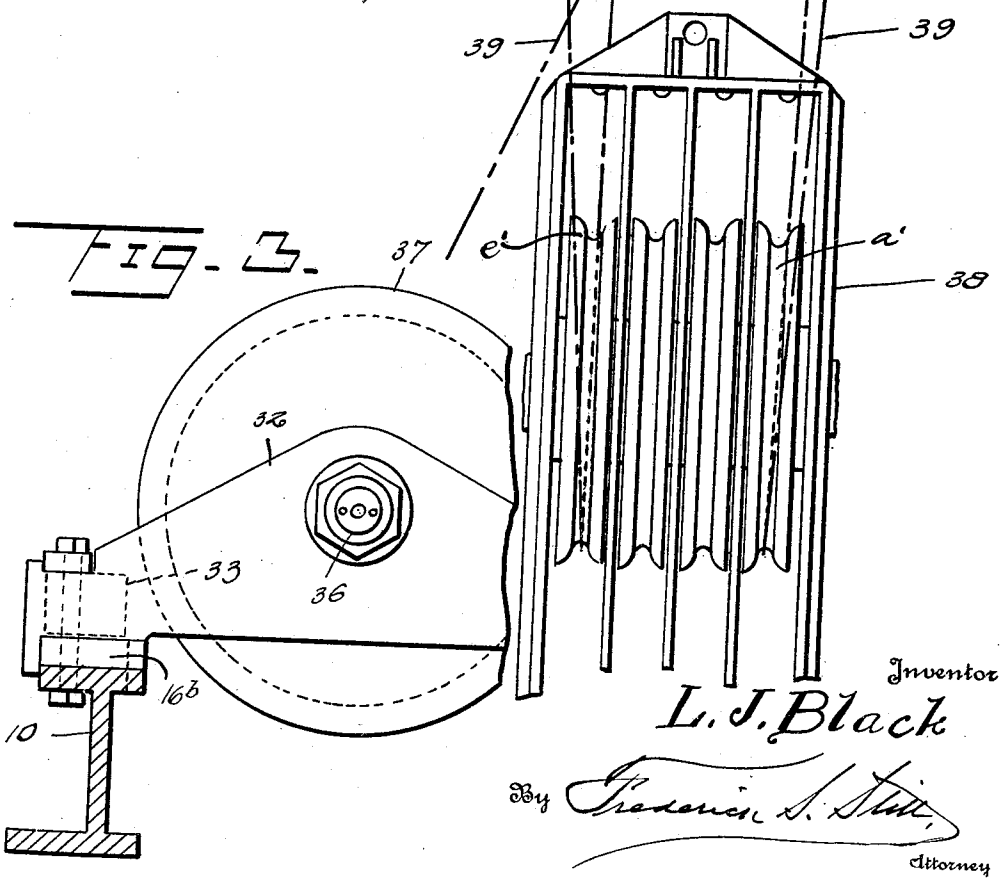


Fig. 3.



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UNITED STATES PATENT OFFICE

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CROWN BLOCK SHEAVE ASSEMBLY

Application filed August 9, 1930. Serial No. 474,213.

This invention relates to derrick construction for oil wells and particularly to the crown blocks thereof, such crown blocks, for instance, as are shown in my Patent No. 1,668,139, granted May 1, 1928.

The general object of the present invention is to provide a crown block so constructed that the main sheave assembly can be lifted to the top of the derrick and installed on the side members and opposed brackets thereof without disassembling or disturbing the sheave assembly in any way.

A further object of the invention is to provide a construction in which the lower shaft bearings are mounted directly on the side members of the crown block while the upper shaft bearings are mounted directly to the opposed brackets as distinguished from mounting both the upper and lower shaft bearings on said brackets.

A further object is to provide a cross sheave attachment which can be raised to the top of the derrick and installed upon the crown block as a unit, and a further object in this connection is to provide a cross sheave attachment which is so constructed as to keep the traveling pulley block from tipping when running down light and which will very materially aid in the proper stringing of the lines and more specifically to provide a crown block having sheave pulleys and a cross sheave attachment of such construction that means is provided for crossing the block with the line without crossing the lines themselves and stringing up from the crown block to a traveling block pulley.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of a crown block assembly constructed in accordance with my invention;

Figure 2 is a side elevation of the assembly shown in Figure 1;

Figure 3 is a fragmentary elevation of the mounting for the cross sheath, one of the side beams being shown in section;

Figure 4 is an elevation of the crown block assembly in connection with a traveling block, the side beams being also shown in section.

Referring to these drawings, 10 designates the side beams which are shown as of channel iron, these side beams being normally spaced apart by means of the intermediate end spacers 11 held in place by the transversely extending tie rods 12. 13 designates the lower section of the bearing box for the sheave supporting shaft having, of course, the usual upper section 14 detachably engaged with the lower section.

This box is held in place upon the side beams 10 by means of the bolts 15. Also mounted upon the upper faces of the beams 10 are the opposed brackets 16, each bracket having two divergent legs which straddle the bearing boxes 13 and each bracket at its upper end having a flat flange 16*a* upon which the base of the upper bearing 17 is mounted and to which it is bolted, this upper bearing being designed to receive the transversely extending shaft 18 upon which the spacer plates 19 are mounted, these spacer plates being spaced from each other by intermediate spacing sleeves 20, as shown clearly in Figure 4. This shaft may carry upon it the usual catline sheave if desired. Mounted in the bearings 14 is a sheave supporting shaft 30 upon which are mounted the sheaves 31, the spacer plates 19 extending down between and spacing the sheaves from each other in any usual or suitable manner. The particular means of supporting the sheaves upon this shaft 30, the particular means for lubricating this shaft 30, etc., form no part of this invention, a construction whereby the sheaves may be supported and lubricated being illustrated in my prior patent above referred to.

It will be noted that the brackets 16 have their basal portions on one side extended at 16*b* over the faces of the supporting beams 10. Mounted upon the upper faces of these brackets and extending transversely across these faces and across the space between the beams 10 are the supporting brackets 32. These brackets are spaced from each other by the end spacers 33 which are disposed between the brackets 32 and held thereto by the transverse bolts 34. The extremities of these

spacers are T-shaped and overlie the ends of the brackets 32.

These spacers are bolted by vertical bolts 35 to the bases 31 of the brackets 16 and through the flanges of the beams 10, thus holding the brackets in place by the single bolt.

Mounted upon a shaft 36 extending through these brackets 32 is the crossed sheave 37 which cross sheave has a diameter greater than the total width of the gang of sheaves 31 and the spacers between these sheaves. Operating in conjunction with the sheaves 31 and the cross sheave 37 is the traveling block 38, the line 39 being rove around the sheaves 31 and the cross sheave 37, in the manner shown in Figure 4 and as will be later stated.

As before stated, one of the objects of the invention is to facilitate the raising of the crown block to the top of the derrick. In my former patent, the construction was such that the shaft supporting brackets with both bearings had to be lifted as a unit. In the present construction in order to assemble block on top of the derrick, the side beams 10 and the brackets 16 bolted thereto are both raised to the top of the derrick. The end spacers 11 are then removed and the side beams 10 are shifted away from each other. The sheave assembly is then raised as a unit by means of an eye 40 formed in a web 41 which is integral with the sleeves 20. This carries with it, of course, the shaft 18 and the shaft 30 with the sheaves mounted thereon. The side beams 10 and the brackets 16 are then moved under the bearings of both the upper and lower shaft, the bearing for the upper shaft being, of course, raised with the sheave unit. The bolts for the upper bearing are then put in place, the end spacers 11 between the beams put in place, the tie bolts or tie rods 12 tightened up and the assembly is complete.

It will be seen from the above description that with this construction, it is unnecessary to disturb in any maner the sheave assembly in either mounting or dismounting the crown block as the sheave assembly moves as a unit to its position or is taken down from this position as a unit. The cross sheave attachment comprising the brackets 32 with the cross sheave 37 is used when it is desirable to operate the block with only two or three sheaves in operation. In order to string up the line 39 from the hoisting apparatus below, the line would pass up over sheave a, down on the back side of this sheave and around the sheave a' on the traveling block 38, back up and over the cross sheave 37 at right angles, down over sheave e' on the opposite side of the traveling block, back up and over the sheave e or the outside sheave on the opposite side of the crown block, etc. When stringing up the other sheaves, the line is simply reaved through the traveling block sheaves and over the crown block sheaves back toward the sheave a' using any number of sheaves required to handle the load. It will be seen that the traveling block 38 will be kept from tipping when running down light and that by the use of this attachment in connection with the sheaves 31 and the traveling block 38, the two highest speed lines are placed on the opposite sides of the traveling block without crossing the lines so that they will not chafe each other at any point.

It will be noted that in my construction, the bolts 35 not only act to hold the brackets 32 in place, but assist in holding the bases of the brackets 16 to the beams 10.

While I refer to the part 18 as being a shaft upon which the cat line sheave may be mounted, this part 18 may also be and is illustrated as a pin as it often occurs in actual practice that the cat line sheave is hung from the lower part of the beam and oftentimes operators use one of the main sheaves in the block assembly instead of a separate and independent cat line sheave.

It is to be understood that in actual practice the "sleeves" 20 are merely a series of integral, cylindrical bearing members through which the pin 18 passes, these being integral with the web 41 and with the spacing members 19 are detachably supported between these bearing members or sleeves 20.

I claim:—

1. A crown block structure including side members, shaft bearings supported thereon, brackets independent but attachable to the side members and overarching the bearings when in place, a shaft mounted in the upper ends of said brackets, a plurality of spacers depending from said shaft, a second shaft supported by said spacers, and sheaves disposed on the second shaft and between said spacers, the spacers having means whereby the spacers, the two shafts and the sheaves may be lifted as a unit.

2. A crown block structure including side members adapted to rest upon the top of a derrick in spaced relation thereto, shaft bearings supported thereon, brackets independent of but attachable to the side members and when in place overarching the bearings, a shaft extending into the upper ends of said brackets, a plurality of connected spacers through which said shaft passes and having depending webs, the spacers being connected by a longitudinal web having an eye, a second shaft carried by the spacers and adapted to be disposed in the bearings on the side members, and sheaves disposed on the second shaft and between said spacers.

3. A crown block structure including supporting brackets, a shaft having bearings in the upper ends of said brackets, spacing sleeves through which said shaft passes and spaced from each other, webs disposed be-

tween said spacing sleeves and through the upper ends of which the shaft passes, said webs depending from the shaft, the depending members being connected to each other and to the brackets by a longitudinally extending web having an eye, a second shaft passing through the depending webs, sheaves mounted upon the second shaft and between said depending webs, side members upon which the brackets are adapted to be supported, and bearings upon said side members within which the second named shaft is adapted to be engaged.

4. In a crown block structure, side members having bearings mounted thereon, and a sheave assembly including supporting brackets having downwardly extending divergent legs adapted to arch over said bearings and rest at their lower ends upon the side members, a shaft adapted to be supported in the bearings on the side members, a plurality of sheaves on the shaft, and supporting means having depending members through which the shaft passes, said supporting means having an eye and having operative connection to the upper ends of said brackets whereby the brackets, the sheaves and the shaft for the sheaves may be supported as a unit and lowered into position upon the side members.

5. In a crown block structure of the character described, side members, bearings mounted thereon having detachable bearing caps, and a sheave assembly including supporting brackets having downwardly diverging legs adapted to straddle said bearings and rest upon the side members, a transverse element engaged with the upper ends of said brackets, an element through which said transverse member passes, and having an eye and having a plurality of shaft supports, a shaft carried by said supports and sheaves mounted upon said shaft, the shaft being adapted to rest in said bearings on the side members.

6. In a crown block structure, side members, having bearings mounted thereon provided with movable caps, brackets having downwardly divergent legs adapted to rest upon said side members and straddle said bearings, a transverse shaft engageable with the upper ends of said brackets, means connected to said shaft whereby the shaft may be hoisted, depending members mounted upon said shaft, a second shaft carried by said depending members, and sheaves mounted upon said second shaft, the second named shaft being adapted to be engaged in said bearings.

7. In a crown block structure, side members, a shaft mounted thereon and having a plurality of sheaves, transversely extending supporting members mounted upon the side members in front of said sheaves, a shaft passing therethrough at right angles to the shaft upon which the sheaves are mounted, a sheave mounted upon the last named shaft, the last named sheave having a diameter approximately equal to the total width of all of said sheaves, and spacing blocks disposed between said supporting members and bolted to the side members.

8. In a crown block structure, side members, a shaft mounted thereon and having a plurality of sheaves, transversely extending supporting members mounted upon the side members in front of said sheaves, a shaft passing therethrough at right angles to the shaft upon which the sheaves are mounted, a sheave mounted upon the last named shaft, the last named sheave having a diameter approximately equal to the total width of all of said sheaves, and spacing blocks disposed between said supporting members and bolted to the side members, the spacing blocks having laterally projecting lugs extending over the extremities of the supporting members and holding them in place.

In testimony whereof I affix my signature.

LEE J. BLACK.