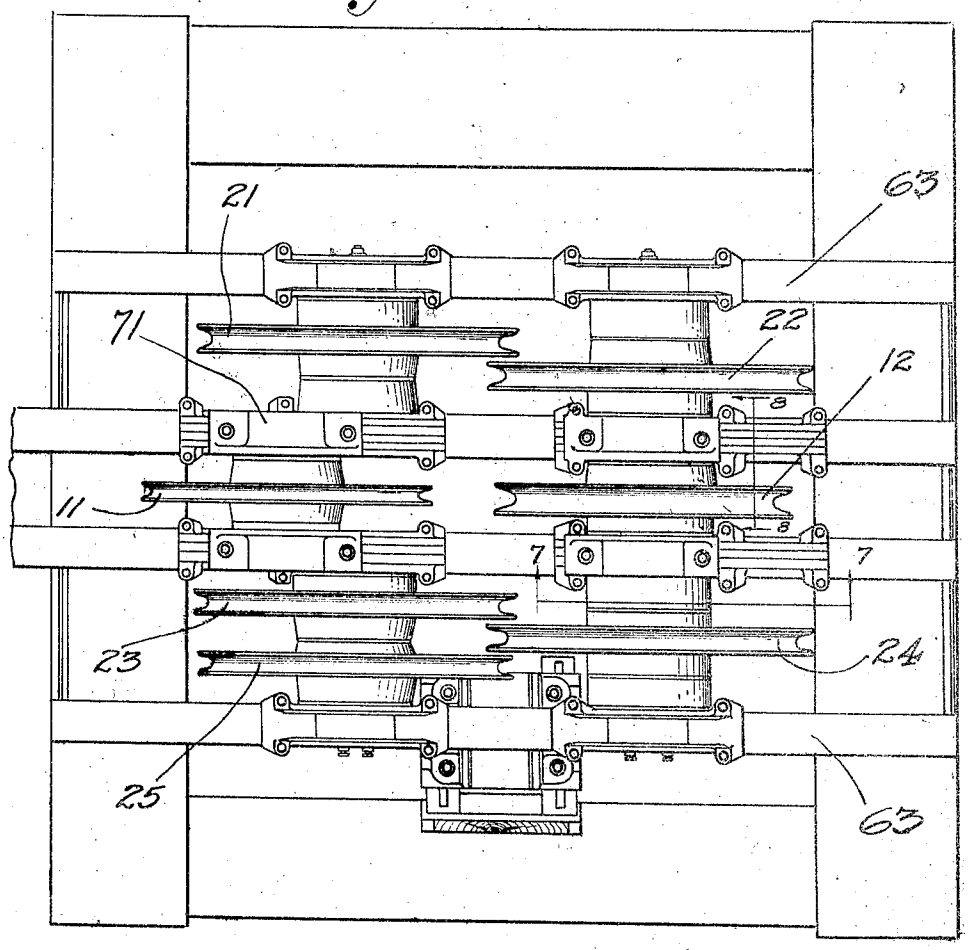
Dec. 1, 1925. 1,563,739

E. W. GOESER

CROWN BLOCK

Filed April 7, 1924 6 Sheets-Sheet 1

Fig. 1.



INVENTOR
EDWIN W. GOESER
BY

Graham & Davis

ATTORNEYS.

Dec. 1, 1925.

1,563,739

E. W. GOESER

CROWN BLOCK

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6 Sheets-Sheet 2

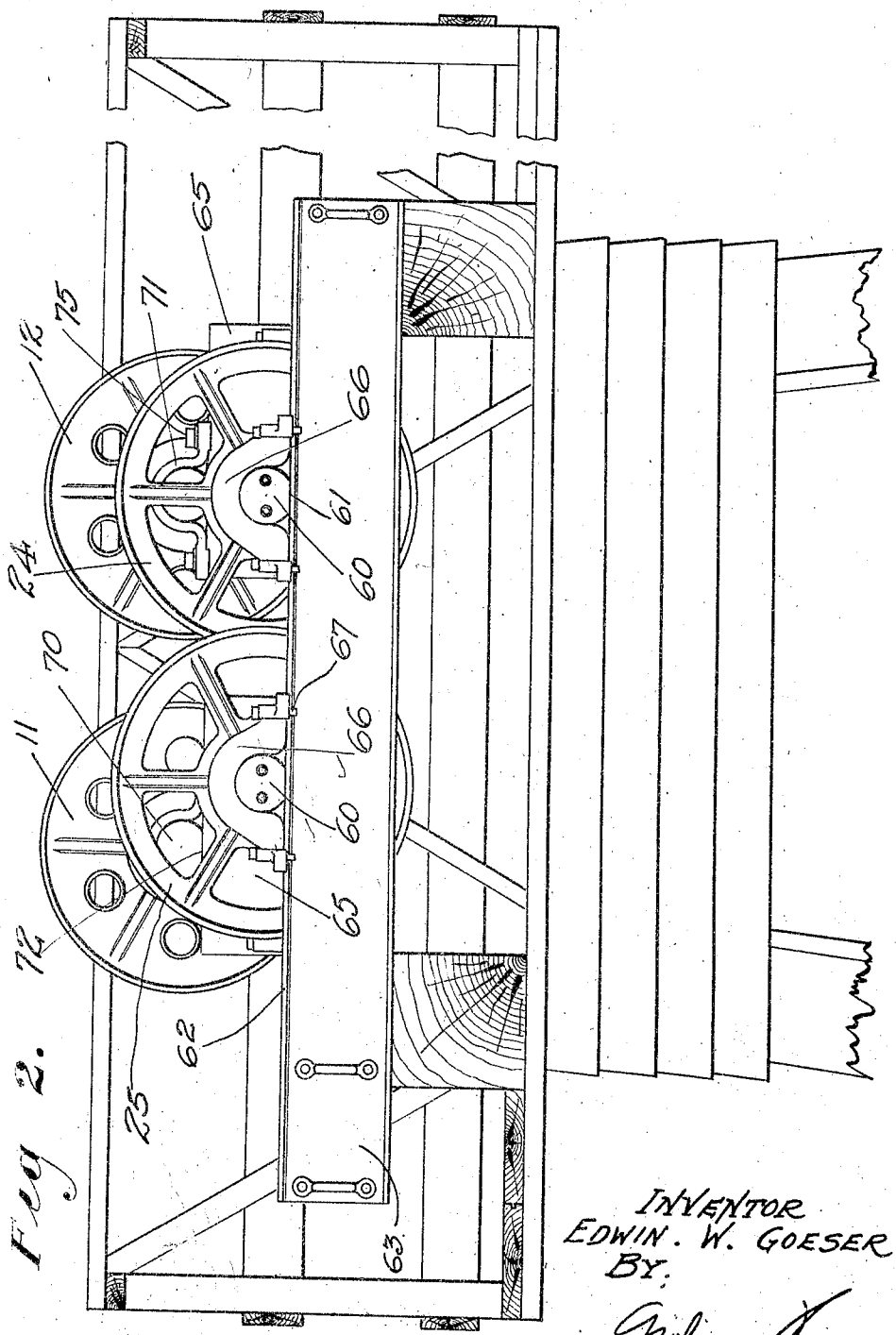


Fig 2.

INVENTOR
EDWIN. W. GOESER
BY.
Gilliam & Lamm
ATTORNEYS

Dec. 1, 1925. 1,563,739

E. W. GOESER

CROWN BLOCK

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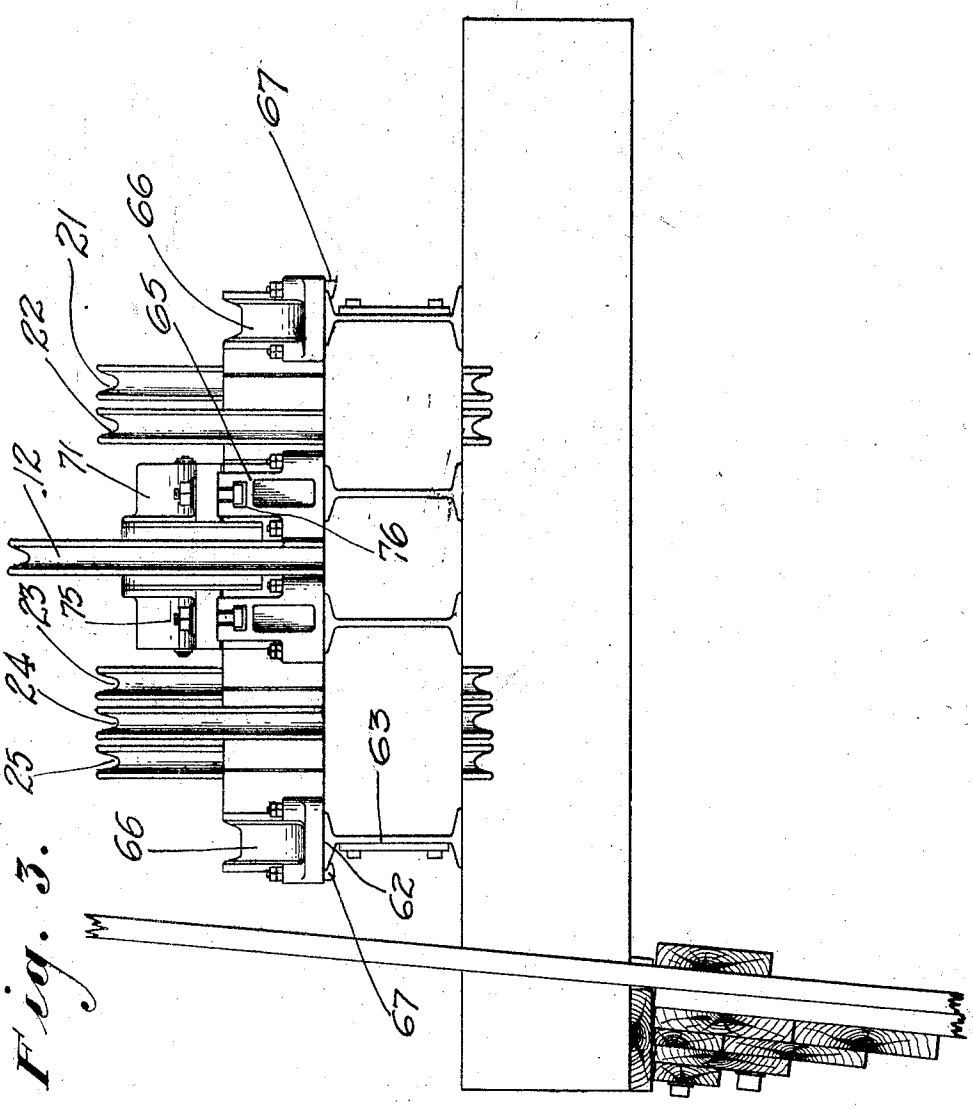


Fig. 3.

INVENTOR
EDWIN. W. GOESER
BY,
Graham & Davis
ATTORNEYS.

Dec. 1, 1925. 1,563,739

E. W. GOESER

CROWN BLOCK

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Fig. 4.

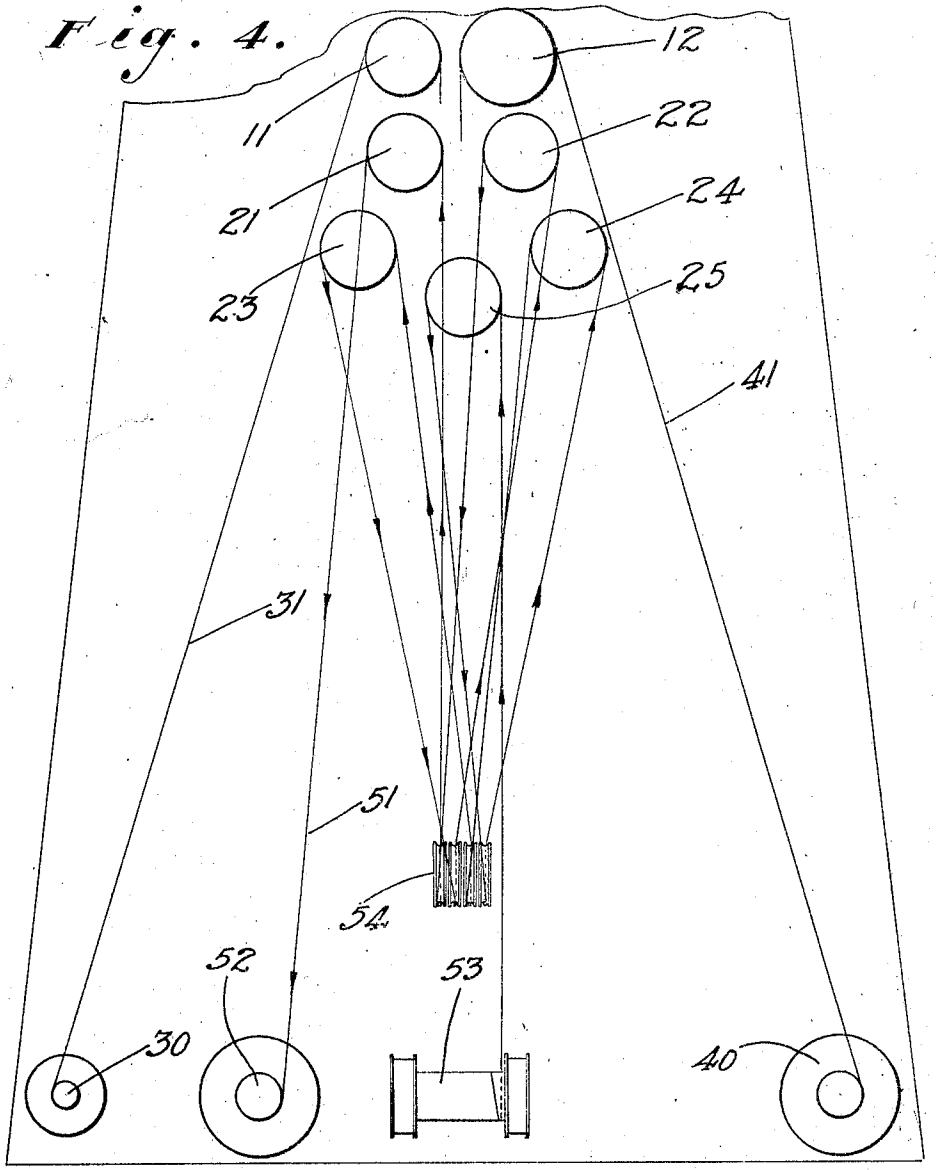
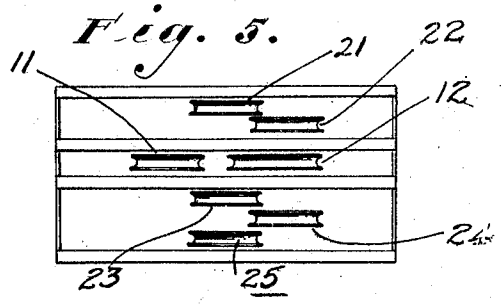


Fig. 5.



INVENTOR
EDWIN. W. GOESER.
BY,
Fulham + Fulham
ATTORNEYS.

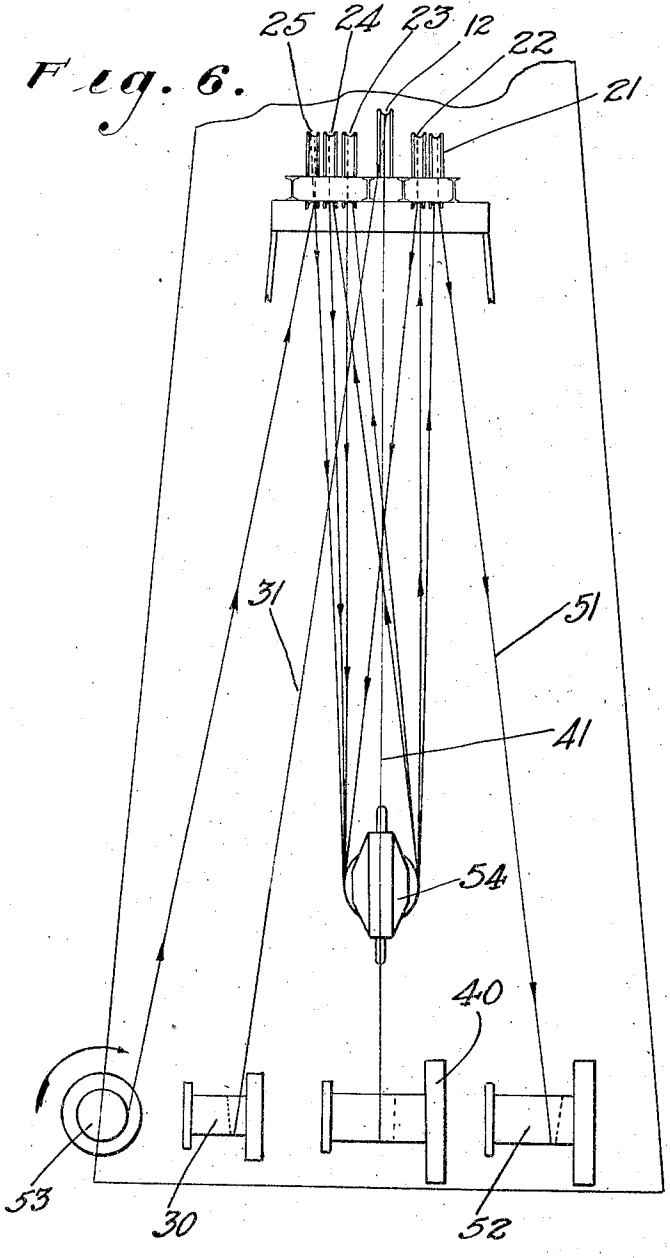
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E. W. GOESER

CROWN BLOCK

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Fig. 6.



INVENTOR.
EDWIN. W. GOESER
BY,
Graham & Dunn
ATTORNEYS.

Dec. 1, 1925. 1,563,739

E. W. GOESER

CROWN BLOCK

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Fig. 7

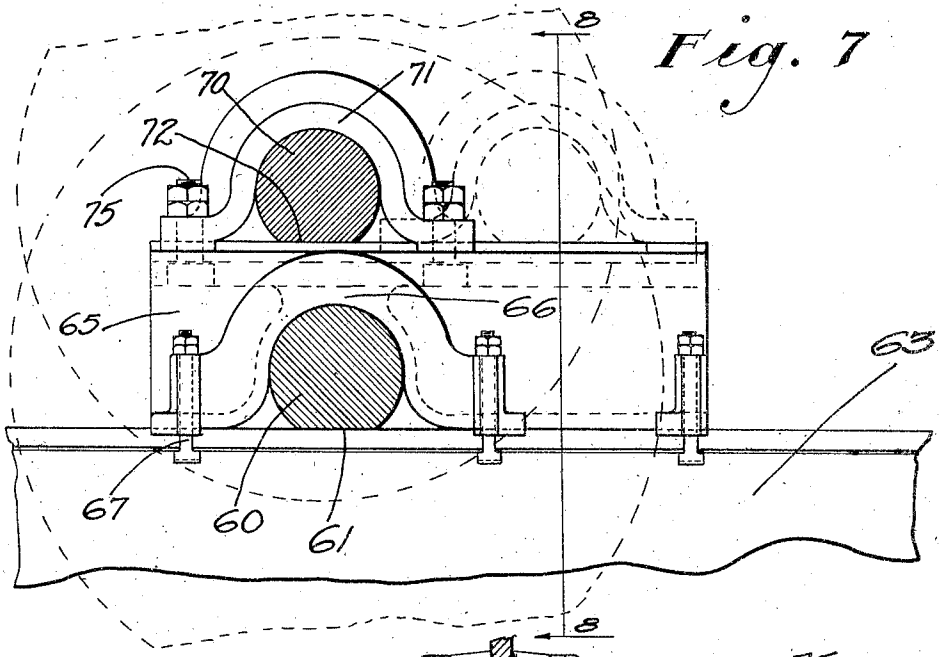
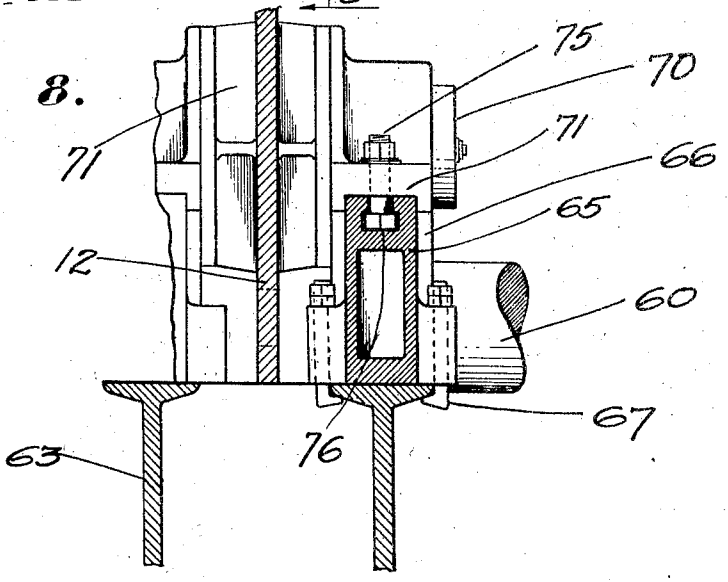


Fig. 8.



INVENTOR
EDWIN. W. GOESER
BY,
Gilham + Hamm
ATTORNEYS.

Patented Dec. 1, 1925. 1,563,739

UNITED STATES PATENT OFFICE.

EDWIN W. GOESER, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO EMSCO TOOL COMPANY, A CORPORATION OF CALIFORNIA.

CROWN BLOCK.

Application filed April 7, 1924. Serial No. 704,665.

To all whom it may concern:

Be it known that I, EDWIN W. GOESER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Crown Block, of which the following is a specification.

My invention relates to the derricks used over oil wells and particularly to the crown blocks used on such derricks. In the production of oil, a derrick is erected for the purpose of drilling the well and for the purpose of performing certain necessary operations thereon after the well is completed and put on production. This involves the use of wire ropes which are used to suspend the pipe and tools. These wire ropes are wound on the bull wheel, the calf wheel, the draw works, or the sand reel and pass upwardly therefrom over sheaves situated on the extreme top of the derrick and known collectively, with their associated parts, as the crown block.

It is an object of my invention to provide a crown block, the sheaves of which are independently adjustable. It is usual, in the standard crown block, to provide seven sheaves, one of which takes a wire rope from the bull wheel, one of which takes a wire rope from the sand reel, and the other five of which take a single wire rope connected at one end to the calf wheel and at the other end to the draws, being intermediately threaded through the five sheaves of the crown block and through the sheaves of a pulley or casing block suspended by said wire rope and connected to the load to be lifted. It is necessary that the pull of the different load lifting combinations of rope be as nearly vertical as possible, and it is necessary that the various sheaves and particularly the bull wheel and sand reel sheaves be adjustable transversely in the crown block for this purpose. It is also desirable that the bull wheel and sand reel sheaves be so mounted that the bearings thereof do not interfere in any way with the bearings of the remaining sheaves, thus permitting large sheaves to be used and reducing the deterioration on the wire rope due to the use of the smaller sheaves necessarily provided in the conventional forms of crown block.

Further objects and advantages will be made evident hereinafter.

Referring to the drawing which is for illustrative purposes only—

Fig. 1 is a plan view of a crown block equipped with the sheaves necessary for rotary drilling.

Fig. 2 is a side elevation thereof.

Fig. 3 is an end elevation thereof.

Fig. 4 is a winding diagram showing how the ropes pass from the various apparatus.

Fig. 5 is a diagram showing the plan of the crown block.

Fig. 6 is a side elevation of the apparatus shown in Fig. 4.

Fig. 7 is a detailed view of the brackets used.

Fig. 8 is a view partly in section on a plane represented by the line 8—8 of Fig. 7.

In the accompanying drawings, I have shown a crown block equipped with seven sheaves, the sheave 11 being provided for the sand line, the sheave 12 being provided for the bull line, and the sheaves 21, 22, 23, 24 and 25 being provided for the main hoisting line. The derrick is provided with a sand reel 30 and a sand line 31 which passes upwardly over the sand reel sheave 11 and downwardly to the floor of the derrick. The sand line 31 is used during the drilling of the well to operate the bailer or do any other light hoisting about the derrick floor. The derrick is also provided with a bull wheel 40 having a bull line 41 which passes upwardly over the bull wheel sheave 12 and downwardly to the center of the derrick. The bull wheel sheave is preferably so mounted that the bull wheel line 41 which drops away therefrom is exactly in the center of the derrick. One end of the main hoisting line 51 is wound upon the calf wheel 52, the calf wheel being used to shorten or lengthen the line 51 to meet changing conditions, the calf wheel being adapted to wind up a considerable length of this line. The other end of the line 51 is wound upon a drum forming a part of the draw works 53 of the rotary equipment. The line 51 passes upwardly from the calf wheel 52 over the sheave 21, downwardly under a sheave in the pulley block 54, upwardly over the sheave 22, downwardly under a sheave in the pulley block 54, upwardly over the sheave 23, downward-

ly under a sheave in the pulley block 54, upwardly over the sheave 24, downwardly under a sheave in the pulley block 54, upwardly over the sheave 25, and downwardly to the draw works 53.

In some cases where the tools or pipe to be lifted are not too heavy, one or more of the sheaves 21 to 25 may be dispensed with, the arrangement shown being that ordinarily used for heavy rotary drilling. It is very desirable that all of the sheaves on the crown block be adjustable within limits to prevent side pull on the ropes and my invention makes particular provision for accomplishing this object. The sheaves 21 to 25 inclusive, which may be denominated the lower sheaves, are so mounted as to turn freely on shafts 60 which have lower flattened surfaces 61. The sheaves 21, 22 and 24 are each mounted alone on a shaft 60 while the sheaves 23 and 25 are mounted together on a shaft 60, as shown in Fig. 1. These surfaces 61 rest directly upon the upper edge of one flange 62 of I-beams 63, these I-beams forming a supporting structure for the lower sheaves 21 to 25. Mounted to slide freely on the top 62 of the I-beam 63 are lower brackets 65, these brackets having a semi-cylindrical saddle 66 resting on the shafts 60. Passing through holes in the brackets 65 are clamp bolts 67 which extend down under the upper flange of the I-beam 63 and enable the lower brackets 65 to be clamped in any position along the top of the I-beams. This enables a proper adjustment to be made of the sheaves 21 to 25 and permits the maximum diameter of sheave to be used in this position of which the derrick is capable.

Since the sheaves 11 and 12, which may hereinafter be termed upper sheaves, are not used for the same purpose as the sheaves 21 to 25 but form parts of entirely different hoisting systems, it is necessary that they be capable of adjustment independently of the sheaves 21 to 25. This I accomplish by mounting the upper sheaves 11 and 12 on shafts 70 which have a flattened surface 72 resting on the top of the brackets 65. The brackets 65 are made of sufficient length to allow the upper shafts 70 to be given a considerable movement thereon as, for example, from the position shown in full lines in Fig. 7 and the position shown in dotted lines in that figure. Brackets 71 are provided for engaging the top of the shafts 70. Bolts 75 are provided for pulling the brackets 71 downwardly, these bolts having heads sliding in T slots 76 formed in the top of the brackets 65. It will be evident that with this construction the upper sheaves 11 and 12 may be adjusted on the tops of the brackets 65 so that the upper sheaves may be moved into the proper position quite independent of the lower sheaves. This is a great advantage over the present method of mounting these sheaves, in which all of the shafts 60 and 70 are supported directly on the supporting structure 63, and it is necessary to find room for the brackets 71 between the brackets 65. By my form of construction, it is possible to adjust the upper and lower brackets independently, and since both sets of brackets are independently adjustable with their axes in different planes, it is possible to use much larger sheaves than in the former types of construction. These larger sheaves are very desirable as they greatly reduce the wear on the wire ropes, the amount of this wear being in inverse proportion to the size of the sheaves from which the ropes pass.

I claim as my invention:

1. In an oil well derrick, the combination of: a supporting structure at the top of the derrick; lower brackets mounted in pairs on said structure; lower shafts, each supported in one of said pairs of brackets; lower sheaves, each sheave turning freely on one of said lower shafts; upper brackets mounted in pairs on said lower brackets and adjustable horizontally; upper shafts, each mounted in one of said pairs of upper brackets and upper sheaves, each turning freely on one of said upper shafts.

2. In an oil well derrick, the combination of: a supporting structure at the top of the derrick; lower brackets mounted in pairs on said structure; lower shafts each supported in one of said pairs of brackets; lower sheaves, each sheave turning freely on one of said lower shafts; upper brackets mounted in pairs upon said lower brackets; upper shafts, each mounted in one of said pairs of upper brackets; and upper sheaves, each turning freely on one of said upper shafts.

3. In an oil well derrick, the combination of: a supporting structure at the top of the derrick; lower brackets mounted in pairs on said structure and adjustable horizontally; lower shafts, each supported in one of said pairs of brackets; lower sheaves, each sheave turning freely on one of said lower shafts; upper brackets mounted in pairs on said lower brackets and adjustable horizontally; upper shafts, each mounted in one of said pairs of upper brackets; upper sheaves, each turning freely on one of said upper shafts; a pulley block suspended below all of said sheaves and adapted to be attached to the load to be lifted; a main wire rope threaded through said lower sheaves and said pulley block; means for winding up said main wire rope; auxiliary wire ropes passing over said upper sheaves; and means for winding up said auxiliary wire ropes.

4. In an oil well derrick, the combination of: a supporting structure at the top of the derrick; lower brackets mounted in pairs on said structure; lower shafts each supported

in one of said pairs of brackets; lower sheaves, each sheave turning freely on one of said lower shafts; upper brackets mounted in pairs upon said lower brackets; upper shafts, each mounted in one of said pairs of upper brackets: upper sheaves, each turning freely on one of said upper shafts; a pulley block suspended below all of said sheaves and adapted to be attached to the load to be lifted; a main wire rope threaded through said lower sheaves and said pulley block; means for winding up said main wire rope; auxiliary wire ropes passing over said upper sheaves; and means for winding up said auxiliary wire ropes.

5. In a crown block for use in oil well derricks, the combination of: a supporting structure at the top of the derrick; a lower bracket resting upon said supporting structure; means for securing said lower bracket on said supporting structure; an upper bracket; and means for securing said upper bracket on said lower bracket.

6. In a crown block for use in oil well derricks, the combinaiton of: a supporting structure at the top of the derrick; a lower bracket resting upon said supporting structure; means for securing said lower bracket on said supporting structure; an upper bracket resting upon said lower bracket; and means for adjustably securing said upper bracket on said lower bracket.

7. In a crown block for use in oil well derricks, the combination of: a supporting structure at the top of the derrick; a lower bracket resting upon said supporting structure and having a flat upper face on the upper surface thereof; means for securing said lower bracket on said supporting structure; an upper bracket; and means for securing said upper bracket on said lower bracket.

8. In a crown block for use in oil well derricks, the combinaion of: a supporting structure at the top of the derrick; a lower bracket resting upon said supporting structure and having a flat upper face on the upper surface thereof; means for securing said lower bracket on said supporting structure; an upper bracket resting upon the flat upper face of said lower bracket and horizontally adjustable; and means for securing said upper bracket on said lower bracket.

9. In a crown block for use in oil well derricks, the combination of: a supporting structure at the top of the derrick; a lower bracket resting upon said supporting structure and having a flat upper face on the upper surface thereof; means for securing said lower bracket on said supporting structure; an upper bracket resting upon the flat upper face of said lower bracket and slidable thereon; and means for securing said upper bracket on said lower bracket.

10. In a derrick crown block: a supporting structure; a lower shaft bracket adjustably mounted on said structure; and an upper shaft bracket adjustably mounted on said lower shaft bracket.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 17th day of March, 1924.

EDWIN W. GOESER.