July 15, 1930. A. B. CROSTHWAIT 1,770,845

DERRICK

Filed Oct. 21, 1927 3 Sheets-Sheet 1

Fig. 1.

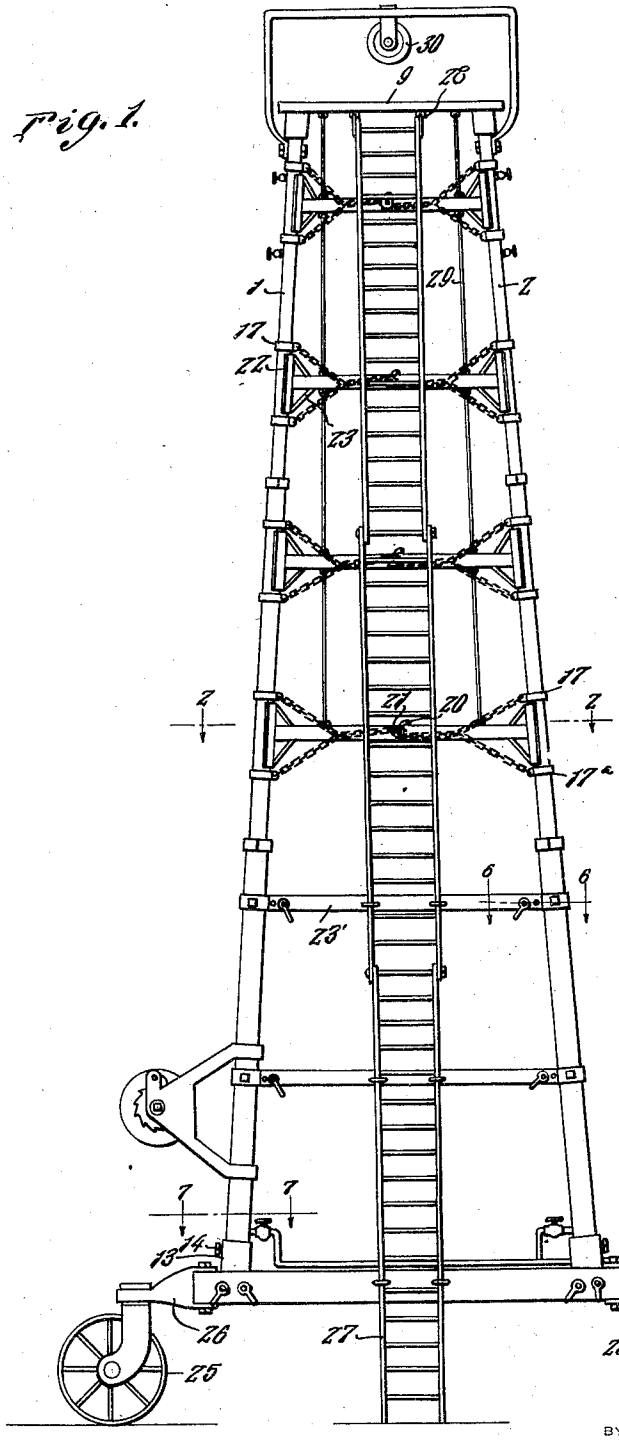
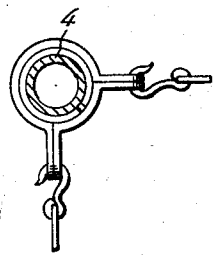


Fig. 5.



A. B. Crosthwait
INVENTOR

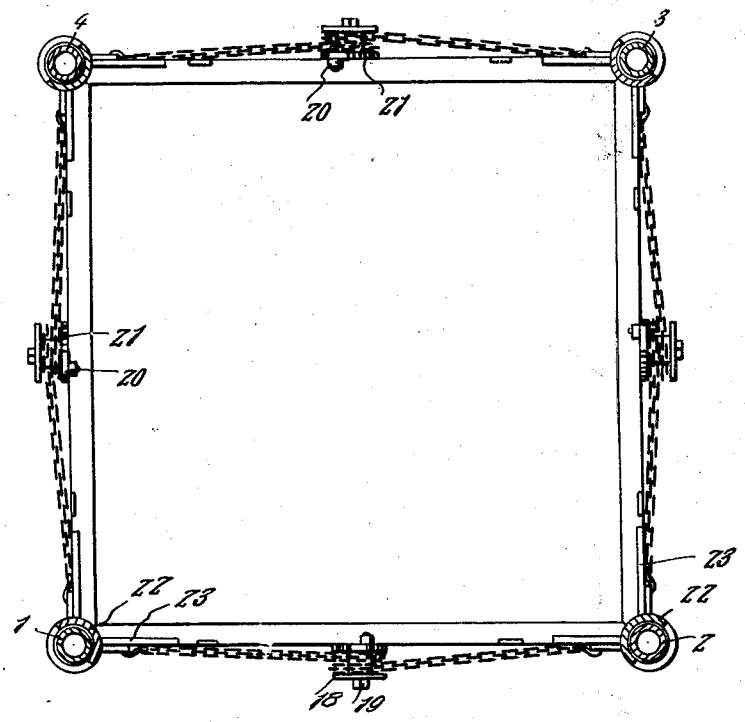
BY Victor J. Evans
ATTORNEY

July 15, 1930. A. B. CROSTHWAIT 1,770,845

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Filed Oct. 21, 1927 3 Sheets-Sheet 2

Fig. 2.



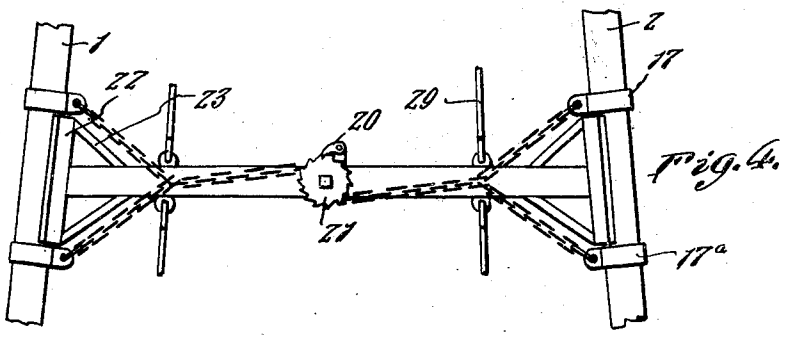


Fig. 4.

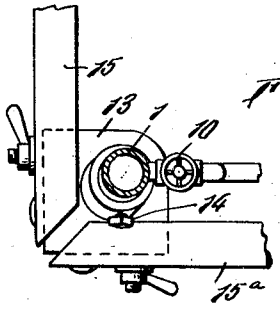


Fig. 7.

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July 15, 1930. A. B. CROSTHWAIT 1,770,845

DERRICK

Filed Oct. 21, 1927 3 Sheets-Sheet 3

Fig. 3.

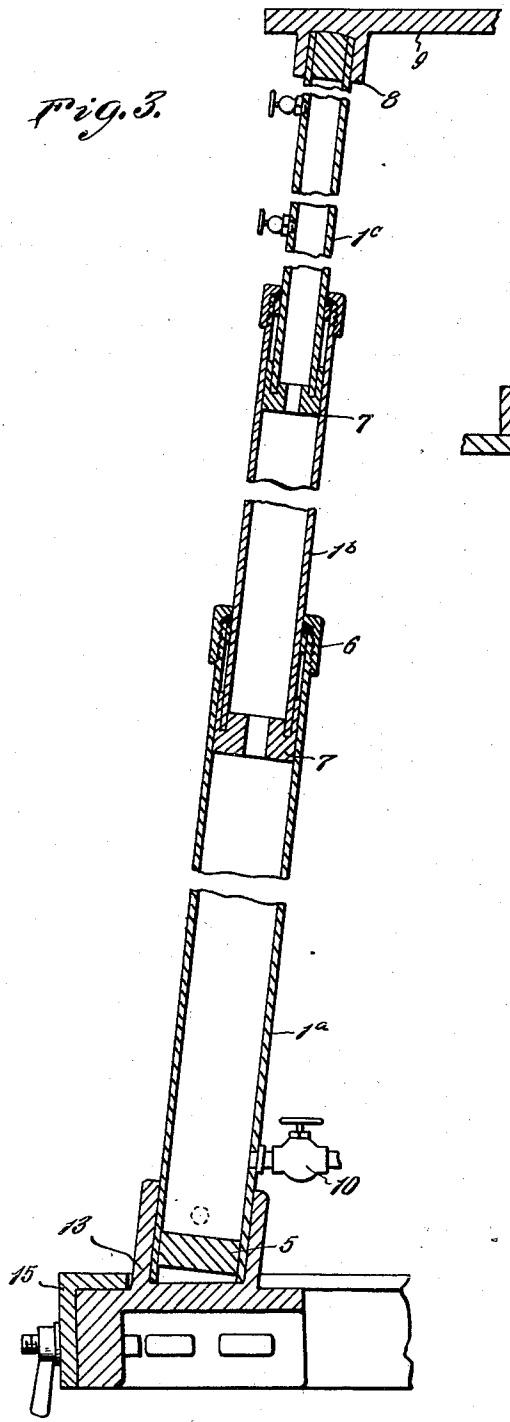


Fig. 6.

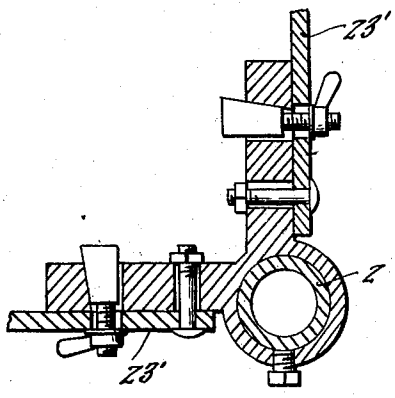


Fig. 8.

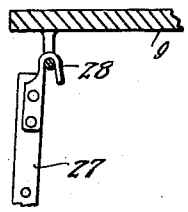
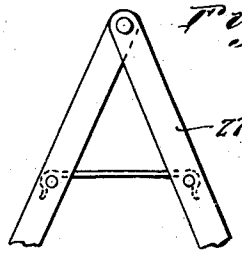


Fig. 9.



A. B. Crosthwait

INVENTOR

BY Victor J. Evans

ATTORNEY

Patented July 15, 1930 1,770,845

UNITED STATES PATENT OFFICE

ASA B. CROSTHWAIT, OF EBANO, MEXICO

DERRICK

Application filed October 21, 1927. Serial No. 227,744.

The invention relates to derricks, the object being to provide a strong telescopic structure which may be transported to the point of use and raised by hydraulic power. The four posts are tubular, each in multiple sections in sliding relation and packed fluid-tight at the joints by which air may be pumped in to lengthen the posts and raise the derrick. A set of castings mounted in the bottom sill permits it to be wheeled to place of use in collapsed condition and pumped up to the required height. The means are provided for effectively bracing the structure which will hereinafter be fully described, and the novel features specified in the claim.

In the accompanying drawings, illustrating the invention:

Figure 1 is a side elevation of a derrick embodying the invention.

Figure 2 is a cross section on the plane 2—2 of Figure 1.

Figure 3 is a vertical section through one multiple section of the post.

Figure 4 shows flexible strengthening means.

Figure 5 is a transverse section of a post and chain connection.

Figure 6 is a section on the plane 6—6 of Figure 1.

Figure 7 is a section on the plane 7—7 of Figure 1.

Figure 8 is a sectional detail, showing a ladder support, and

Figure 9 is a detail of a ladder in use.

Referring in detail to the drawings.

The frame of the derrick is composed of four tubular posts 1, 2, 3, and 4 of a size to telescope within each other at adjacent joints. I employ multiple sections, three as herein shown, of sufficient aggregate length when assembled to give the derrick the height required. The bottom section of each tubular post section is plugged oil tight, as indicated at 5, Figure 3, and the upper end carries a screw cap by which packing may be used at the joint with the adjacent section 1^b, the upper end of which has a similar packing cap to make a seal with the top post section 1^c. The sections 1^b and 1^c at the lower ends are brazed to a snug fitting perforated plug 7 and a plug 8 is brazed at the upper end of section 1^c to form a seat for the crown block 9 of the derrick. The section 1^c is provided at its upper end with a pair of pet cocks to prevent escape of liquid when fluid pressure is applied. The fluid pressure is applied to each post by a valve 10 one of which is provided with conducting pipes connecting in a main to a hydraulic pump. The bottom post sections rest in a casting having an integral socket therefor. There are four of these castings, one for each mast or pole, bolts 14 making the bottom firm. The bottom sills of the derrick 15, 15^a clamp to the castings 13 by a pair of tapered bolts 16 with a reduced screw threaded end 16^a on which a nut may be drawn tight after the tapered body has been struck a blow to effect a solid connection. Two of these bolts are used on each side of the sills. The bottom sills are of angle iron. Each tubular joint is provided with a pair of brazed collars 17, 17^a to which are hooked flexible connections as chains, (see Figure 5,) adapted to be wound on a drum 18, (see Figure 2) rotated by a squared shaft 19 and locked by a pawl 20 cooperating with a ratchet 21. Thus the masts are drawn into tight engagement with iron beams, the ends of which are shod with semi-cylindrical terminals 22 which bear against the mast sides with a lining of non-abrasive material as wood. The terminals 22 are braced by brazed struts 23′. This construction prevents sinking of the mast tubes and gives the structure great stability. The bottom mast sections are connected between each pair by a structural iron beam 23′ secured to a right angled sleeve passed over the section and locked by a set screw 24, (see Figure 6), the beams 23′ being secured to the wedging clamps 16 and stud bolt. A gin pole is bolted to the mast below the crown block 9 and carries a sheave 30 for hoisting a cable. The derrick is mounted on castings provided with sockets 26 bolted to the corner sills permitting it to be shifted from place to place on four casters. I provide a sectional ladder 27 with pivoted bolted joints and a pair of hooks 28 with which the topmost section may be hung in eye bolts carried by the crown block 9. Adjacent sections may be used to form adjust-

ments in assembling the derrick. Rods or chains connect the crown block with the intermediate mast sections 1^b and reduce vibration and rocking due to wind. A hand winch is mounted on one of the masts for hoisting purposes, the squared shaft of which permits a crank to be applied for hoisting. In operation, an adjustment is possible at all times by means of the ladder, the hinged section of which forms a tripod (see Figure 9), to facilitate erection of the derrick. In erecting the derrick the bottom sills are bolted together at the corner to form a firm foundation. The three ladder sections are light enough so that three men can stand them up to form a tripod over the corner of the main foundation. I pass thru the top of the tripod a line and secure it to the end of the derrick post by means of which the winch facilitates raising the derrick posts and locating them in the sockets in the corner foundation. I then secure in place the lower struts to steady the lower mast section and connect the pipe system to a hydraulic pump by which the telescopic sections of the mast may be adjusted vertically. The posts being assembled the ladder is hooked to a top chain at the top of the posts and one end of the gin pole is also connected, the derrick is then raised to its full height carrying the ladder and gin pole with it. An operator then climbs the ladder and secures the other end of the gin pole and passes a rope through the sheave at its top and the rope is lowered and attached to the crown block. By means of the winch the crown block is raised and the operator seats it in its sockets on the end of the pole, the posts being drawn to alignment with the sockets by the chain and a hand jack. After assembling and adjusting the derrick, a cement or timber support may be placed beneath the bottom sills to prevent shifting of the rolling base. As the apparatus is made of steel, and has great stability, it is adapted to service in oil fields.

Having thus described the invention, what I claim is:—

A derrick construction comprising a multiplicity of telescopically associated vertically adjustable frame sections, collars arranged at spaced intervals upon each of the sections, beams disposed horizontally of the derrick adjacent to and between said collars, terminals for the beams horizontally disposed thereon for flush engagement with the frame sections, drums mounted upon the beams, and flexible connections carried upon the collars having adjustable connection with the drums to prevent displacement of the beams from the frame sections.

In testimony whereof I affix my signature.

ASA B. CROSTHWAIT.