Oct. 1, 1929. T. S. PARK 1,729,894

STEEL DERRICK CONSTRUCTION

Filed Nov. 16, 1926 3 Sheets-Sheet 1

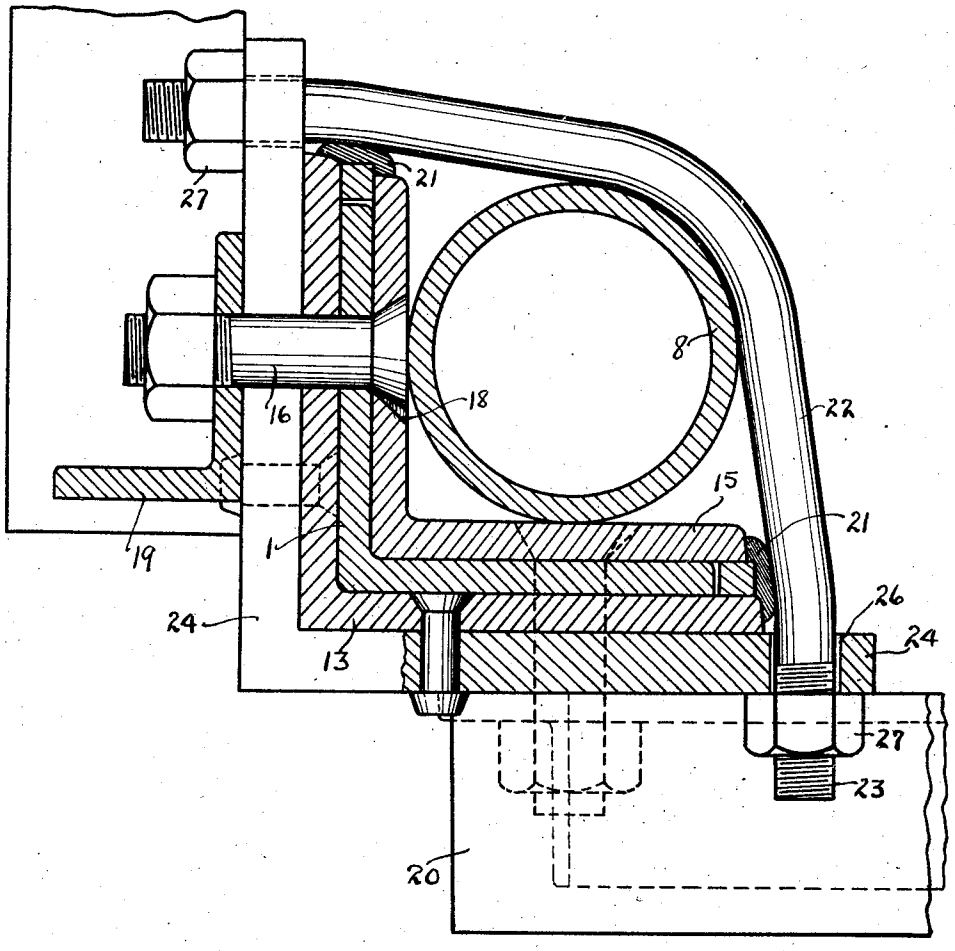


Fig. 1.

Tracy S. Park Inventor

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STEEL DERRICK CONSTRUCTION

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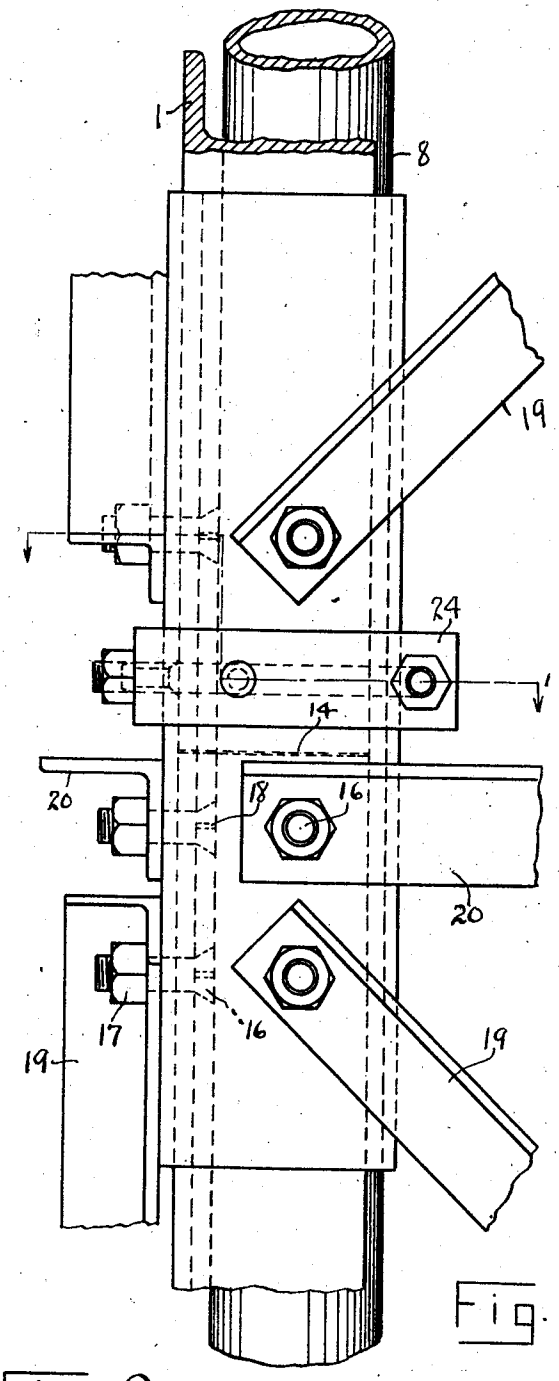


Fig. 2

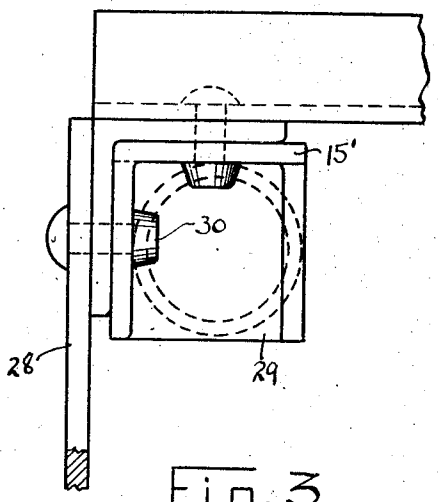


Fig. 3.

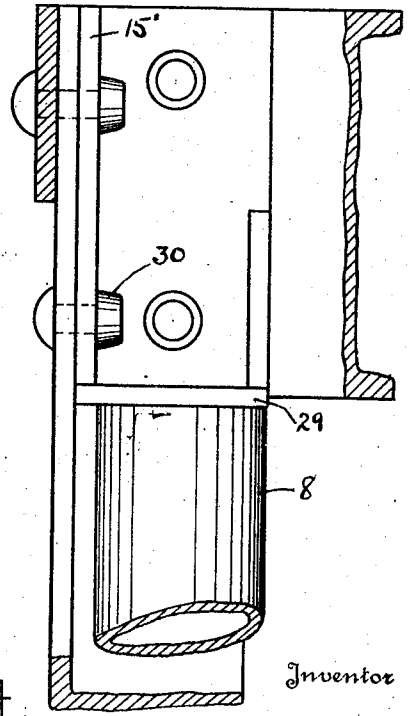


Fig. 4.

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STEEL DERRICK CONSTRUCTION

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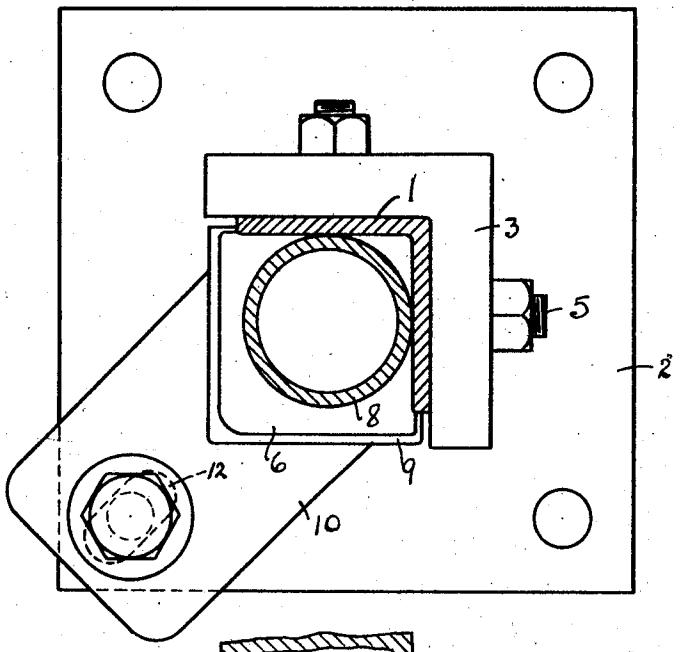


Fig. 5.

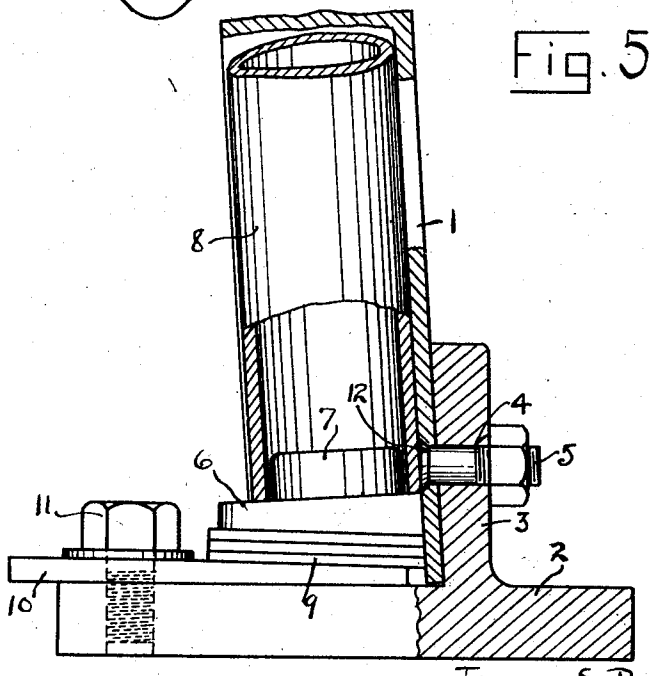


Fig. 6.

Tracy S. Park Inventor

By Jesse R. Stone

Attorney

...will be ... as shown. Said back plate 25 also has a marginal rim

Patented Oct. 1, 1929 1,729,894

UNITED STATES PATENT OFFICE

TRACY S. PARK, OF HOUSTON, TEXAS

STEEL-DERRICK CONSTRUCTION

Application filed November 16, 1926. Serial No. 148,650.

My invention relates to the construction of steel derricks or similar structures and relates particularly to oil well derricks for use in well drilling.

An object of the invention is to provide a particularly strong and durable derrick which may be constructed partly with material at hand in the oil field.

Another object is to provide a joint clamping means readily and cheaply applied in the building of the structure which will maintain a firm connection at all times. Other objects of the invention residing in details of construction and arrangement of parts will more particularly appear in the description which follows.

Referring to the drawing forming a part of this specification, Fig. 1 is a transverse section through a joint or connection between the derrick sections taken on the plane 1—1 of Fig. 2. Fig. 2 is a side elevation of a connection between the derrick sections. Fig. 3 is a top plan of the upper corner of the derrick. Fig. 4 is a broken side elevation thereof. Fig. 5 is a top plan of a base plate shown in section through one of the corner supports; and Fig. 6 is a side elevation, partly in section of the said corner support and base plate. Like numerals of reference are applied to like parts in all the views.

In the construction of the derrick frame a foundation is ordinarily made of piles or posts driven into the ground to a suitable depth. On this foundation, a frame of channel iron is placed to receive a platform approximately square in shape. The corner supports are of angle iron particularly strong and rugged. The corner supports are extended upwardly by sections and inclined inwardly toward the top to support the crown block. Said supports are braced by transverse connections at the joints and diagonal braces, and to this extra pieces of angle iron 1 supported upon the base in the manner shown in Figs. 5 and 6. At the lower end of the leg I contemplate employing a base plate 2 approximately rectangular, having an upright flange 3 thereon shaped to fit the outer base of the derrick leg 1. It is of thick and sturdy construction and has in the two sides thereof openings 4 to receive bolts or rivets 5 by means of which the leg of the derrick is secured firmly to the plate. As the four corner legs of the derrick are inclined inwardly from the base toward the upper end, the upstanding flange 3 of the plate is inclined on its inner face to fit against the derrick leg, and upon the base for the said leg I employ a separate plate 6 which is horizontal on its lower face and inclined upwardly on its inner face to correspond with the angle of the derrick leg. As will be noted in Fig. 6 the plate 6 fits against the derrick leg and has an upper lug 7 thereon circular in shape to fit within a tubular supporting member 8. Beneath the plate 6 and inside the derrick leg are a series of flat wedges or shims 9 which are adapted to be forced under the plate 6 firmly against the lower end of the tubular member 8. A bottom wedge shaped plate 10 is employed to force the shims 9 against the plate 6. This wedge shaped plate is held in position by means of a bolt 11 fitting within an elongated opening 12 in the said plate 10. The bolt 5 previously referred to, is preferably formed with a head 12 countersunk in the inner face of the derrick leg 1 so as to be held in position by the tubular supporting member 8.

The derrick legs are made in sections as is customary in metallic frame works of this character, and I employ a connecting means for the sections which I find particularly efficient. It comprises an outer tie plate 13, which is in fact an angle iron of slightly

opposite legs of the derrick, which are secured to the said legs at the section joints and the bolts 16 are extended beyond the clamping plates in some instances to also attach said diagonal braces 19 to the legs. These diagonal braces are preferably of angle iron as shown in Fig. 2 and are of the construction now sometimes employed. There is also a horizontal transverse beam 20 of angle iron and the bolts 16 extending therethrough also serve to secure the plates 13 and 15 to the derrick leg.

As a further means of securing the tie plates firmly to the derrick leg, I contemplate welding a strip of fusible metal 21 to the edges of the tie plates and against the edges of the derrick leg. This is done by placing a strip of metal in position covering the edges of the three plates, as shown in Fig. 1, and applying a heating means such as an electrical welding device to the strip and fusing it and forcing it into connection with the edges of the plates. In this manner there is formed a tie plate at the ends of the derrick leg sections which entirely surrounds the joints.

In reinforcing and strengthening the derrick legs made of angle iron in the manner stated, I contemplate using a tubular supporting member 8, which is under ordinary circumstances made of heavy pieces of pipe, say 3″ or 4″ in diameter, depending upon the size of the derrick, secured together at

22. Said bolts [illegible] against the said pipe at [illegible] point of said bolt, and has the ends [illegible] tended through a steel tie strap 24 which is bent at right angles to fit against the outer plate 13 and is of sufficient length to extend a suitable distance beyond said tie plates at both sides. The projecting ends are provided with openings 26 at each end to receive the ends of the tie bolt 22. Nuts 27 are screwed upon the projecting ends of the bolt for the purpose of clamping and holding the bolt in position. The opening 26 in each end of the tie plate 24 is made slightly larger than the

8 will bear against the heads of said bolts and hold them against removal in case the clamping nuts thereon become disengaged through the vibration of the derrick. The bolts 22 therefore serve to hold the leg 8 firmly against the angular portion of the derrick leg and also serve to prevent the loosening of the bolts 16 employed in securing the joints together.

At the upper ends of the derrick legs there are the usual transverse tie plates 28 secured to the derrick legs in the usual manner and the inner tie plate 15′ is bent inwardly at its lower end as shown at 29, to provide a plate against which the upper end of the tubular leg 8 may contact and thus assist in supporting a crown block. The plates are secured together at this end of the derrick by means of rivets 30, thus assuring against removal of the bolts or pins which connect the frame work together at this point.

The points of advantage in my derrick construction lie in the manner in which the joints are made between the sections and in the combination between the tubular leg and the angle iron which forms the usual derrick leg whereby the construction is not only light and also cheap in construction, but is particularly strong and efficient. The manner in which the parts are secured together not only holds the tubular portion of the leg in position but assists in retaining the clamping bolts 16 against accidental removal. The combination of parts thus described will be of par[illegible]struction, as [illegible]ed in the art

[illegible] protect by Let-

[illegible]p of sectional [illegible]nected together, [illegible]ner faces of said [illegible]s secured to said [illegible]g bolts, tubular supports [illegible]s of said angle-iron legs, means tying [illegible] legs and supports together, whereby said bolts are held in position.

2. A derrick frame made up of sectional corner legs of angle-iron connected together; tie plates on the outer and inner sides of said legs at the joints thereof, said plates being connected together to make one integral plate, outwardly extending plow bolts extending through said plates and legs, and an inner

tubular support on each of said legs secured to said legs to bear against the heads of said bolts and hold them in position in the manner described.

3. A derrick frame the sectional corner legs of which are secured together at the joints by integral angular plates surrounding said legs, bolts securing said plates to said legs, tubular corner supporting members secured to said legs in such manner as to bear against and retain said bolts in position.

4. In a derrick frame, sectional corner legs of angle iron, tie plates at the joints entirely surrounding said joints, outwardly extending bolts through said plates and legs, a tubular supporting member bearing against the inner ends of said bolts, an angle tie strap extending beyond said leg and plates, and a bolt curved around said tubular member and passing thru the edges of said strap whereby the joint is retained in assembled position.

In testimony whereof I hereunto affix my signature this 12th day of November, A. D. 1926.

TRACY S. PARK.