Aug. 28, 1923. 1,465,969

C. R. B. CLAFLIN

DERRICK

Filed Feb. 18, 1920 2 Sheets-Sheet 1

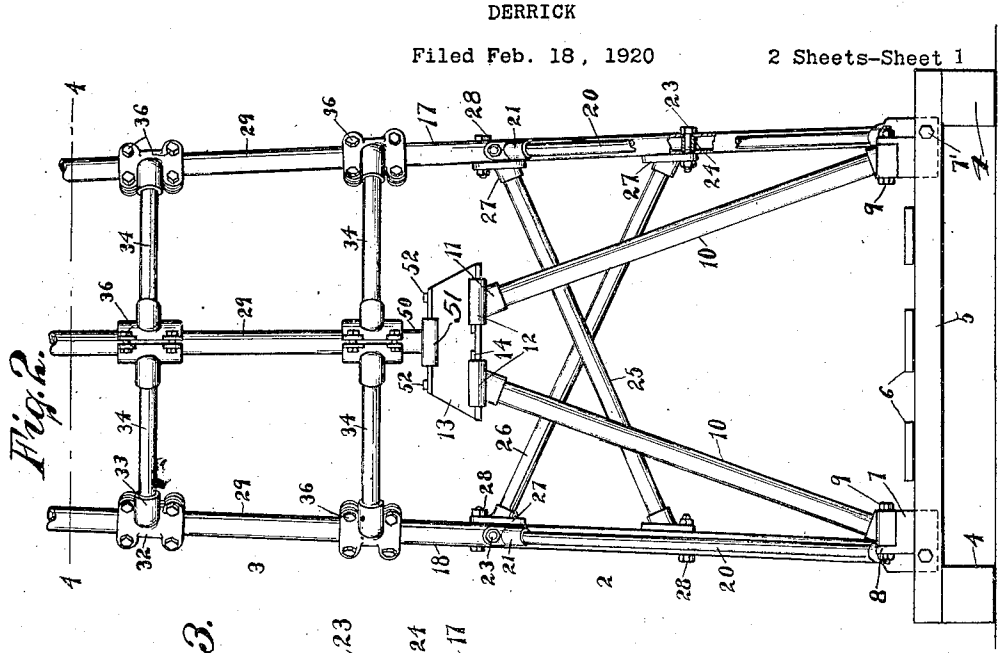


Fig. 2.

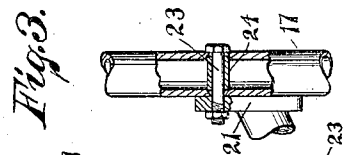


Fig. 3.

Fig. 1.

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Filed Feb. 18, 1920 2 Sheets-Sheet 2

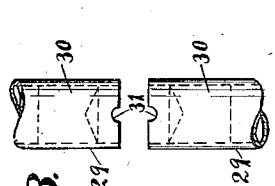


Fig. 8.

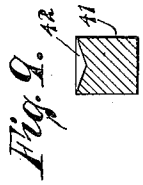


Fig. 9.

Fig. 4.

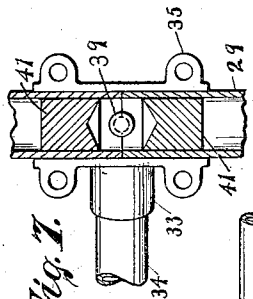


Fig. 7.

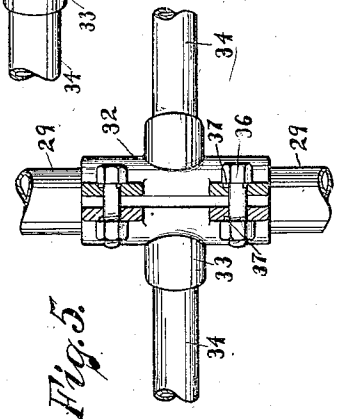


Fig. 5.

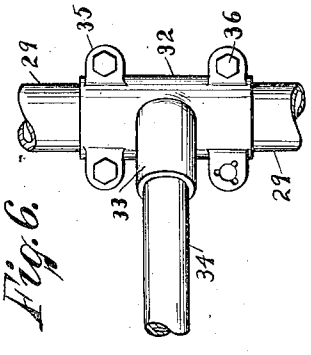


Fig. 6.

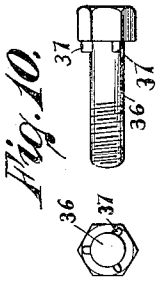


Fig. 10.

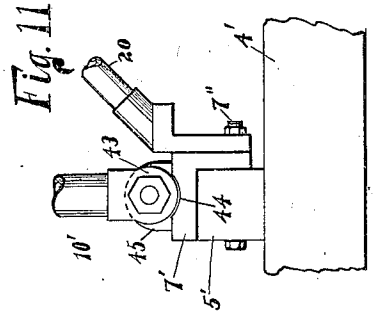


Fig. 11.

INVENTOR

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Patented Aug. 28, 1923. 1,465,969

UNITED STATES PATENT OFFICE.

CHARLES R. B. CLAFLIN, OF HARTFORD, CONNECTICUT.

DERRICK.

Application filed February 18, 1920. Serial No. 359,598.

To all whom it may concern:

Be it known that CHARLES R. B. CLAFLIN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, has invented certain new and useful Improvements in Derricks, of which the following is a specification.

This invention relates to what I shall term a skeleton tower. I adopt this title as a matter of convenience but I should note that the apparatus is of particular advantage when employed in connection with the drilling of oil and other wells and many like purposes. It is within the bounds of possibility as may be inferred that some of the features of the invention may be used with equal advantage in other constructions. I have a number of motives in view although my primary and principal object is the provision of simple and effective means by which the structure can be quickly and readily erected and which can be as easily dismounted, yet which has means by which the parts are held assembled, in a stable, solid and positive manner against accidental collapse.

There are other features of novelty and advantage which with the foregoing will be discussed at length in the following description wherein I will outline in detail several of the many forms of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. This disclosure is made to enable those skilled in the art to practice the invention. I am not restricted thereto. I may obviously depart therefrom in many respects within the scope of the invention defined by the claims following said description, for as I have observed in effect the invention comprises certain broad relations.

Referring to said drawings:

Figure 1 is a side elevation of the lower portion of a skeleton tower involving the invention.

Fig. 2 is a front elevation or as seen from the left in Fig. 1.

Fig. 3 is a detail partly in elevation and with a portion broken away and in section, of a joint.

Fig. 4 is a cross section on the line 4—4 of Fig. 2 looking downward and with certain portions broken away.

Fig. 5 is a detail view partly in cross section of two of the cross bars, an associated clamp, and parts of two adjoining sections of a column.

Fig. 6 is an elevation of the same.

Fig. 7 is a vertical sectional view of the structure shown in Figs. 5 and 6.

Fig. 8 is a view in elevation of adjoining parts of two of the sections of a column.

Fig. 9 is a sectional view of a plug.

Fig. 10 is a detail view of a bolt.

Fig. 11 is a detail view of a modification.

Like characters refer to like parts throughout the several views which are on different scales.

As shown the structure comprises in its makeup a sub or primary unit and a superimposed or secondary unit. As the designations indicate the superimposed unit is ordinarily arranged above the primary unit. These terms however are used more or less for convenience in distinction. The two units may be associated together or the upper structure may be used with an entirely different sub or primary structure or vice versa.

The base or primary structure or unit which I have selected for illustration is denoted in a general way by 2, the super or secondary structure being denoted in a general way by 3, the base or primary structure constituting a convenient and proper support for the super or secondary structure 3.

The primary structure as represented comprises the sills 4 generally arranged in parallelism and laid upon the ground or piers in the vicinity for instance of a well to be dug. On the sills and as shown at right angles thereto are the struts 5 also disposed in parallelism and at right angles to the respective sills. On the struts 5 may be laid boards or planks 6 to present a platform. Near the ends and upper sides of the front strut 5 are mounted the blocks 7 usually of some metal which have ears or lugs 8 on their upper sides to which are pivoted as by bolts 9 the feet of the two braces or supports 10 usually of tubular construction or of piping. These braces 10 converge upwardly and are furnished with heads 11 which as shown are provided with lateral flanges 12 which receive between them the base flange of the crown piece 13 shown as being of eye form in cross section the base flange of the crown piece resting upon the heads 11 which are tightly clipped by the side flanges 12. The two heads may move outwardly yet they are positively prevented from coming

directly in contact as by stops as 14 rigid with the flanged base of the crown piece 13 as shown best in Fig. 2. The stops therefore definitely prevent the too close approach of the heads. I will describe hereinafter the way the crown piece 13 is associated with the super or secondary structure 3. The blocks 7 are held suitably in position as by bolts 7′ extending through the front strut 5 and through the inner, depending flanges of said block.

The back strut 5 has upon it near the opposite ends thereof the blocks 15, having upstanding rear flanges 16 to which are connected as by bolts the posts 17 and 18 as illustrated both in Figs. 1 and 2. These posts 17 and 18 are at the back of the base or primary structure 2 and as shown are not parallel, converging upwardly but not however at such a great angle to the vertical as that of the braces 10. To the blocks 7 are shown as connected for instance by the bolts 7′, the diagonal braces 20 the upper ends of these braces being connected with the posts 17 and 18 just below the upper ends thereof in a substantial manner as I will later set forth. The heads 21 of these diagonal braces 20 are provided on their rear sides with flanges the posts 17 and 18 being respectively perforated to receive suitable fastenings as bolts 23 the nuts of which bear against the flanges of said heads 21 as shown best in Fig. 3. Around the bolts 23 within the respective posts 17 and 18 are bushings as 24 the terminals of which solidly and substantially fit seats in the inner surfaces of the respective posts. Between the posts 17 and 18 are braces or cross pieces as 25 and 26 the terminals 27 of which are exactly like the terminals of the diagonal braces 20 these terminal portions 27 being associated with the posts 17 and 18 desirably in the exact manner as are the upper end portions of the diagonal braces 20, the bolts which secure them in position being denoted by 28.

With the base structure which I have described is associated the super structure 3. This base structure is not rectangular in cross section because there are two inclined posts as 17 and 18 at the rear and none strictly speaking at the front. In the construction shown however is a substitute for front posts by which the super structure which is triangular in cross section is effectually sustained and upheld. The support for the super structure is a substantial and a solid one.

The super structure involves as will be understood three columns which however may not stand perpendicularly, and as they are the same in construction a detail description of one of these columns 29 will of course apply to the others the columns as will be clear surmounting the base or primary structure 2. The columns 29 as shown converge upwardly their angle of convergence being practically the same as that of the posts 17 and 18. In Fig. 8 for instance it will be seen that the column 29 comprises as shown several hollow endwise-engaging tubular members 30 of equal diameter the ends abutting in a solid manner.

As represented in Fig. 8 the tubular members have opposite end apertures or notches 31 respectively adapted to mate or register when the ends of the tubular members are in abutment. Surrounding each pair of tubular members at their place of abutment is one complemental clamping member as 32, the tubular or hollow bodies 33 of the respective members 32 receiving the ends of the hollow or tubular braces 34 as shown in Figs. 5 and 6. It will be understood that each clamping member 32 is connected to the end of a co-operating brace 34 the clamping members which are practically semi-circular in cross section fitting around the adjoining ends of the tubular members 30. The halves or sections of the clamping members 32 are as represented furnished with projections 35 perforated to receive bolts as 36 by which the clamping members may be firmly set on the turning of the nuts thereof. The heads of the bolts are preferably interlocked with the projections 35 with which they co-operate so that the nuts of the bolts may be readily turned with a wrench. In this way it is possible to facilitate the assemblage or dismounting of the structure in that a wrench or similar tool or implement can be put around the nut and the latter removed or applied with one hand which is a feature of importance owing to the fact that the bolts are positively held against rotation. The latter is accomplished by furnishing the heads of the bolts with locking lugs as 37 which are adapted to enter seats in the ears 35 for the purpose indicated. Within the halves or sections of the clamping members 32 are studs 38 which are adapted to fit the notches or apertures 31 when the parts are assembled as shown for instance in Fig. 7 these studs for further strength having heads 39 to prevent their accidental separation. There may be fitted in the end portions of the braces 34 the plugs 40 as shown best in Fig. 4. This strengthens or reinforces the braces. In like fashion the tubular members or sections 30 of the columns 29 may have fitted in them the plugs 41 near the ends thereof. These plugs 41 perform a function similar to that of the plugs 40, their outer ends may as shown have conical seats 42. The clamping member 36 at the front and which embraces the lower end of the front column 29 also clamps the shank 50 (Figs. 1 and 2) this shank having a flanged foot 51 the flanges of which fit around the upper flange of the

crown piece 13. Lateral movement of this shank 50 and associated parts is limited by stops 52 on the upper flange of the crown piece.

In Fig. 11 I show a modification. The numeral 4′ represents a sill one of two, on which rest struts 5′ equivalents both of the sills and struts hereinbefore described. The sill 5′ is assumed to be the one at the front of the structure. This sill 5′ supports near its ends blocks 7′ held in place by bolts 7″ the bolts passing through the feet or base portions of braces 20′. Associated with the blocks 7′ are braces 10′ having their feet 43 practically of cylindrical form to fit apertures 44 in the upper surfaces of the blocks 7′. The cylindrical feet 43 are hugged by lugs 45 on the blocks 7′.

It will be noted that certain of the parts are held in assembled relation not only by clamping means but that they are automatically locked by independent means thus giving positively double assurance against accidental collapse or buckling. It is also clear that the structure can be mounted or dismounted in a ready, easy manner which is a feature of consideration in that heretofore the condition has not been possible. It will also be evident that the parts will be held in assembled relation in a thoroughly stable and substantial manner.

I desire also to make it clear that I have illustrated and described but two of the many forms of the structure. Clearly I may depart in many ways from the showing made by the annexed drawings and the foregoing description within the scope of the invention defined by the claims following said description.

It is an important feature and to which I wish to call attention that the crown piece 13 aids in preventing collapse of the structure. A derrick or its equivalent is often set up on soft ground. This crown piece or its equivalents prevents positively the collapse of the derrick in such a case, relieving effectually the wrecking strain.

What I claim is:

1. A skeleton tower comprising complemental posts, braces co-operative with the posts, a crown piece adjustably connected to the braces, and means for limiting the lateral motion of the crown piece.

2. A skeleton tower comprising complemental posts, flexibly mounted braces co-operative with the posts, a superstructure supported by the posts and a crown piece sustained by the braces to aid in upholding the superstructure and connected with the braces to permit independent motion of the braces.

3. A skeleton tower comprising an approximately rectangular base, an approximately triangular superstructure supported by the base, and means between the base and the superstructure, to permit of changing their relative positions to compensate for change in position of one or more of the elements of the base.

4. A skeleton tower comprising a base structure, a superstructure supported by the base structure, and means between the base structure and the superstructure, for permitting relative movement of the elements when the parts are in assembled relation.

5. A skeleton tower comprising complemental posts, flexibly mounted braces co-operative with the posts, a crown piece over the base of which the braces are flanged, a superstructure and a part connected with the superstructure and also flanged over the crown piece to thus permit lateral adjustment of the crown piece with relation to the tower.

6. A skeleton tower comprising complemental posts, flexibly mounted braces co-operative with the posts, a crown piece over the base of which the braces are flanged, a superstructure and a part connected with the superstructure and also flanged over the crown piece to thus permit lateral adjustment of the crown piece with relation to the tower, the crown piece having stops to limit said lateral adjustment.

7. A skeleton tower comprising posts, upwardly-converging flexibly mounted braces, the bases of the braces being approximately in horizontal line with those of the posts, a crown piece distinct from and connected with the upper ends of the converging braces, columns connected with the respective posts, a column adjustably connected with the crown piece, the several columns constituting a superstructure, crossed braces between the posts and diagonal braces extending from the bases of the converging braces to the posts.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES R. B. CLAFLIN.

Witnesses:

ELSIE M. RABENSTEIN,

HEATH SUTHERLAND.