

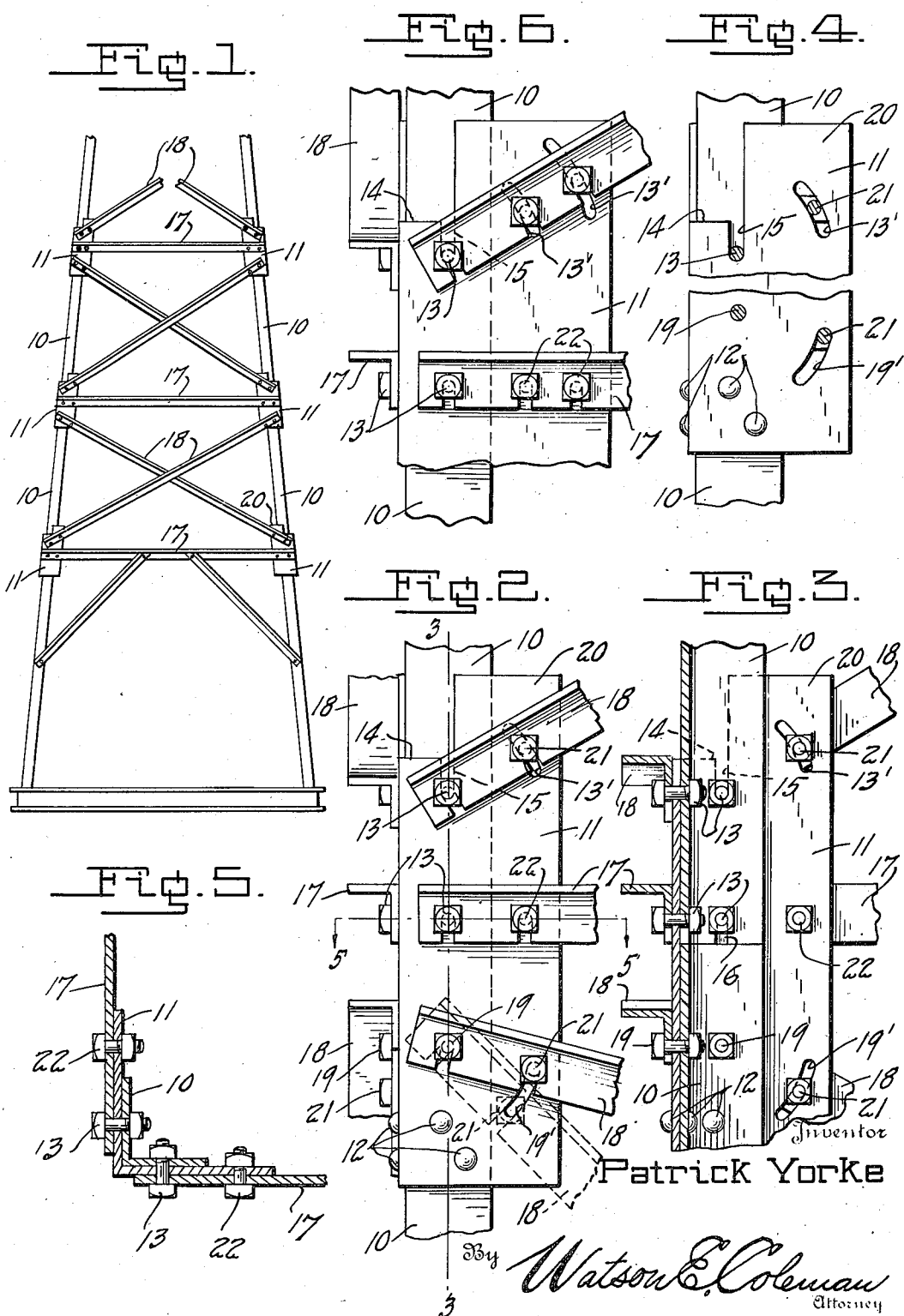
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P. YORKE

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DERRICK

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UNITED STATES PATENT OFFICE.

PATRICK YORKE, OF WASHINGTON, PENNSYLVANIA.

DERRICK.

Application filed August 23, 1922. Serial No. 583,824.

To all whom it may concern:

Be it known that I, PATRICK YORKE, a citizen of the United States, residing at Washington, in the county of Washington, and State of Pennsylvania, have invented certain new and useful Improvements in Derricks, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in derricks, and more particularly to a metallic derrick structure.

An important object of the invention is to provide a novel attaching plate by means of which the girts and braces of the derrick may be secured to the legs thereof.

A further object of the invention is to provide a single attaching plate capable of use in duplicate at each story of the derrick, the construction thereof providing for the changing angle of the braces of the story.

As is well known to those familiar with the art, in the construction of derricks and particularly that type of derrick employed in the oil fields, the derrick is tapered from the bottom to the top and the stories of the derrick or sections thereof are commonly made of the same height. The legs of the

derrick are made up in sections of a given length and these sections are assembled and the girts and braces applied to maintain the leg sections in position. For the purpose of this application, plates are provided which serve not only to connect adjacent leg sections but which are likewise provided with means for attaching thereto the ends of the girts and braces. Heretofore, it has

been necessary in the construction of derricks, and more particularly metallic derricks, to provide the braces with but a single fastening means at each end due to the fact that the changing angle of the braces would necessitate, were there more than a single fastening means at each end, a separate

plate construction for each story of the derrick. This construction has been attempted but has been found to be extremely unsatisfactory due to the difficulty of having the plates properly punched so that the openings for the plurality of fastening elements will align and furthermore the cost of constructing so great a number of different types of plates raises the cost of the derrick to a point where it becomes prohibitive.

Where the openings through which the fastenings must be inserted are slightly out of line, which will often be the case with this type of construction, it has been found that the mechanics erecting the derrick will often omit the same. A single fastening means in these braces while sufficing under ordinary stress and strain of the derrick, permits a certain amount of play therein and when unusual stress is applied, will often result in warping of the legs and distortion of the derrick, rendering the same difficult to rebuild and often causing sheering of the retaining elements by means of which the sections of the derrick are maintained in position. It is accordingly desirable that more than a single bolt or fastening be applied to each end of the brace, and an object of this invention, as hereinbefore set forth, is to provide a plate of such construction that it may be employed for connecting the braces and legs of each story of the derrick without altering the construction thereof in any manner and which by its construction compensates for the changing angle of the braces resulting from the tapering of the derrick from foot to crown block.

A still further object of the invention is to provide a device of this character which may be very cheaply and readily produced by the use of a punching machine and which lends itself to application to metallic derrick structures regardless of the type of material employed in the construction of the legs, whether the same be of angle iron, tubular material or any other desired form.

These and other objects I attain by the construction and arrangement shown in the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein like reference characters designate like parts throughout.

In the drawings:—

Figure 1 is a fragmentary side elevation of a derrick constructed in accordance with my invention;

Figure 2 is an enlarged side elevation showing the joint between adjacent leg sections of the derrick and the connections of the girts and braces thereto;

Figure 3 is a sectional view on the line 3—3 of Figure 2;

Figure 4 is a side elevation of the joint, the girts, braces and their connections being removed;

Figure 5 is a section on the line 5—5 of Figure 2;

Figure 6 is a fragmentary side elevation of a slightly modified form of connection plate.

Referring now more particularly to the drawings, the numeral 10 indicates derrick leg sections, in the present instance shown as composed of lengths of angle iron, and 11 indicates plates employed for connecting the upper end of the leg sections of one story of the derrick with the lower ends of the legs of the story next above, these plates being usually secured to the upper end of the lower leg section 10, as indicated at 12, and having means, as bolts 13, whereby the lower end of the leg section next above may be readily attached thereto. In the present instance the plate 11 is shown as notched out at its upper corner, as indicated at 14, and having extending downwardly from the inner corner of this notch a slot 15, and the lower end of the lower leg section 10 is shown as provided with a slot 16, the securing elements extending through the slot 16 just mentioned and through a suitable opening formed in the upper leg section 10, this construction being that disclosed in my prior Patent No. 1,306,793.

The lower bolt 13 forms a support and attaching means for the outer end of a girt 17 while the upper bolt 13 forms a support and attaching means for the outer lower end of a cross brace 18. The plate 11 is provided below the lower bolt 13 hereinbefore described with a further bolt 19 extending through the plate and the upper end of the lower leg 10 and forms a support for the outer upper end of a second cross brace 18.

In accordance with my invention the plate 11 is constructed in such fashion that it is of greater width than the surface of the legs with which it is engaged and projects inwardly from the inner edges of these legs toward the leg at the opposite side of the derrick on the same face, the projecting portion of the derrick being designated by the numeral 20. In this projecting portion at the upper and lower end thereof I form arcuate slots 13' and 19' respectively, these slots having as the center of their curvature, the center of the securing elements or bolts 13 and 19 respectively. In these slots are arranged bolts 21 which are adapted to extend through the braces 18 and form a second securing means therefor. In this extended portion, centrally thereof, I form an opening adapted for the reception of a bolt 22 which forms a second securing means for the girt 17, engaging the girt inwardly of the point of its engagement with the bolt 13. The engagement of the cross braces 18 and

girt 17 with their respective securing elements is preferably in the form of slots opening through the lower edge of the girts and braces so that upon loosening of the securing elements, these girts and braces may be withdrawn without the necessity of completely removing the securing elements and the derrick therefore readily torn down for shipment.

It will be obvious that by the construction recited, the changing angle of the braces 18 as the derrick tapers toward the upper end thereof will be compensated for, the bolts 21 being capable of movement in the slots 13' and 19' and accordingly readily permitting a change of angle of these braces and at the same time permitting a second securing element to be employed. If more than two securing elements at each end of the braces 18 and girts 17 are desired, this may be readily accomplished by enlarging the plate as suggested in Figure 6 and increasing the number of arcuate slots and openings for the bolts 21 and 22 respectively. It will furthermore be obvious that the construction as hereinbefore set forth is capable of some change and modification and that while the plate has been shown as employed with angle iron legs, might readily be adapted to leg constructions of different cross section without in any manner departing from the spirit of my invention, and I accordingly do not limit myself to the specific structure hereinbefore set forth except as hereinafter claimed.

I claim:—

1. A device for connecting the adjacent ends of the leg sections of a derrick to one another and the braces and girts of the derrick to the leg sections, comprising a plate of greater width than the leg sections to which it is applied, having securing elements engaging the outer ends of the braces and other securing elements to engage the braces inwardly of the braces with respect to the first named securing elements, the last named securing elements having engagement with said braces and said plate permitting a variation of the angle of the braces to said leg sections.

2. A device for connecting the adjacent ends of the leg sections of a derrick to one another and the braces and girts of the derrick to the leg sections, comprising a plate of greater width than the leg sections to which it is applied having securing elements engaging the outer ends of the braces and other securing elements to engage the braces inwardly of the braces with respect to the first named securing elements, the last named securing elements having engagement with said braces and said plate permitting a variation of the angle of the braces to said leg sections, the excess width of said plate being arranged inwardly of the leg sections

with which the plate is engaged, the engagement of the last named securing elements with the plate occurring in that portion of the plate forming such excess width.

5 3. A device for connecting the adjacent ends of the leg sections of a derrick to one another and the cross braces of the derrick to such leg sections, comprising a plate of greater width than the leg sections to which
10 it is applied having securing elements engaging the outer ends of the braces and other securing elements to engage the braces inwardly of the ends of the braces with respect to the first named securing elements,
15 said other securing elements operating in slots formed in said plate and curved with the centers of the first named securing elements as a radius to said leg sections.

20 4. The combination with the adjacent ends of leg sections of a derrick, of a plate secured to each thereof, a brace engaging said plate, a securing element extending through the plate and brace, an arcuate slot formed in said plate having the center of
25 the securing element as a radial center, and a securing element extending through said brace and engaged in said slot.

30 5. A device for connecting the adjacent ends of the leg sections of derricks to one another and the braces of the derrick to the leg sections comprising a plate abutting and secured to the adjacent ends of the leg sections and against which the braces abut, securing elements extending through the plate
35 and the ends of said braces and securing the braces to the plate, and other securing elements extending through said braces and having a connection with the plate permitting arcuate movement of the braces with

the first named securing elements as a center whereby said plate may be employed for connecting the leg sections of the derricks at various levels thereof and permit movement of said braces compensating for the variation in angle of the braces. 40 45

6. The combination with the adjacent ends of leg sections of a derrick, of a plate secured to each thereof, a brace engaging said plate, a securing element extending through the plate and brace adjacent the end
50 of the brace, and a slot formed in said plate, and a second securing element directed through said brace and engaging in said slot.

7. The combination with the adjacent
55 ends of upper and lower leg sections of a derrick, of a plate secured to the upper end of the lower leg section and extending thereabove, said plate having a securing element directed therethrough and being provided in its upper end with a slot aligning with said
60 securing element, the upper leg section of the derrick being provided in its lower end with a slot for receiving the securing element of the plate, and above and in alignment with said slot with a securing element
65 for engagement in the slot of the plate.

8. A derrick having the usual legs and braces for said legs, bolts securing the braces to the legs, and a bolt and slot connection between the legs and braces spaced longitudinally of the braces from the first named bolts permitting arcuate movement of the braces with respect to the legs with the first named bolts as a center. 70 75

In testimony whereof I hereunto affix my signature.

PATRICK YORKE.