May 26, 1942. C. G. BOOKER 2,284,120

SPINNING LINE GUIDE

Filed May 29, 1939 2 Sheets-Sheet 1

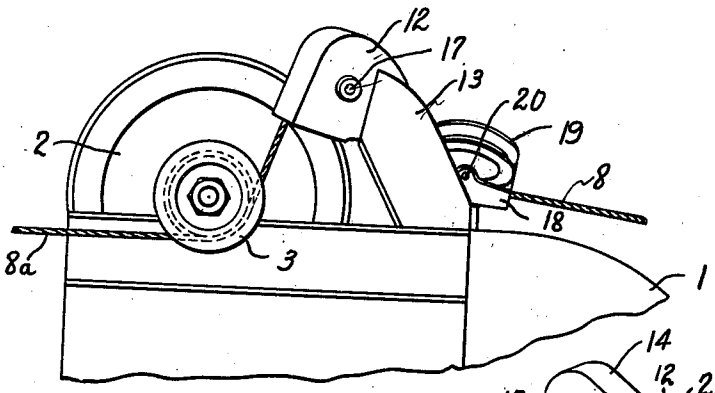


Fig. 1.

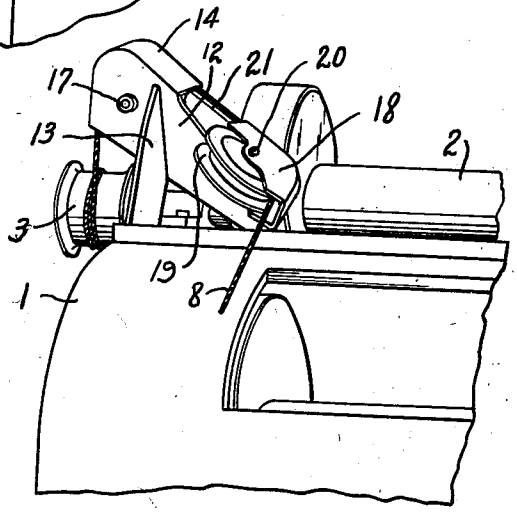


Fig. 2.

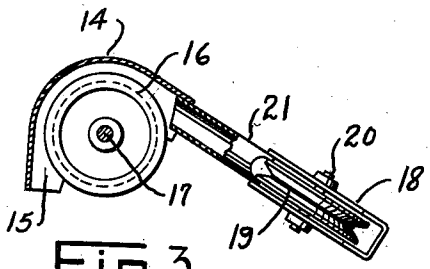


Fig. 3.

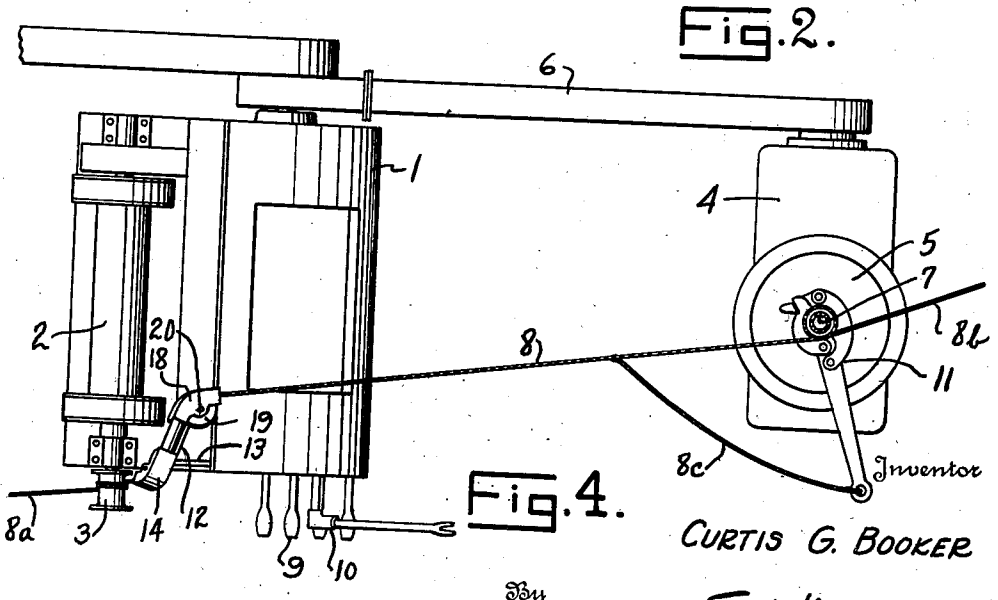


Fig. 4.

Inventor

CURTIS G. BOOKER

By

E. V. Hardway,

Attorney

May 26, 1942. C. G. BOOKER 2,284,120

SPINNING LINE GUIDE

Filed May 29, 1939 2 Sheets-Sheet 2

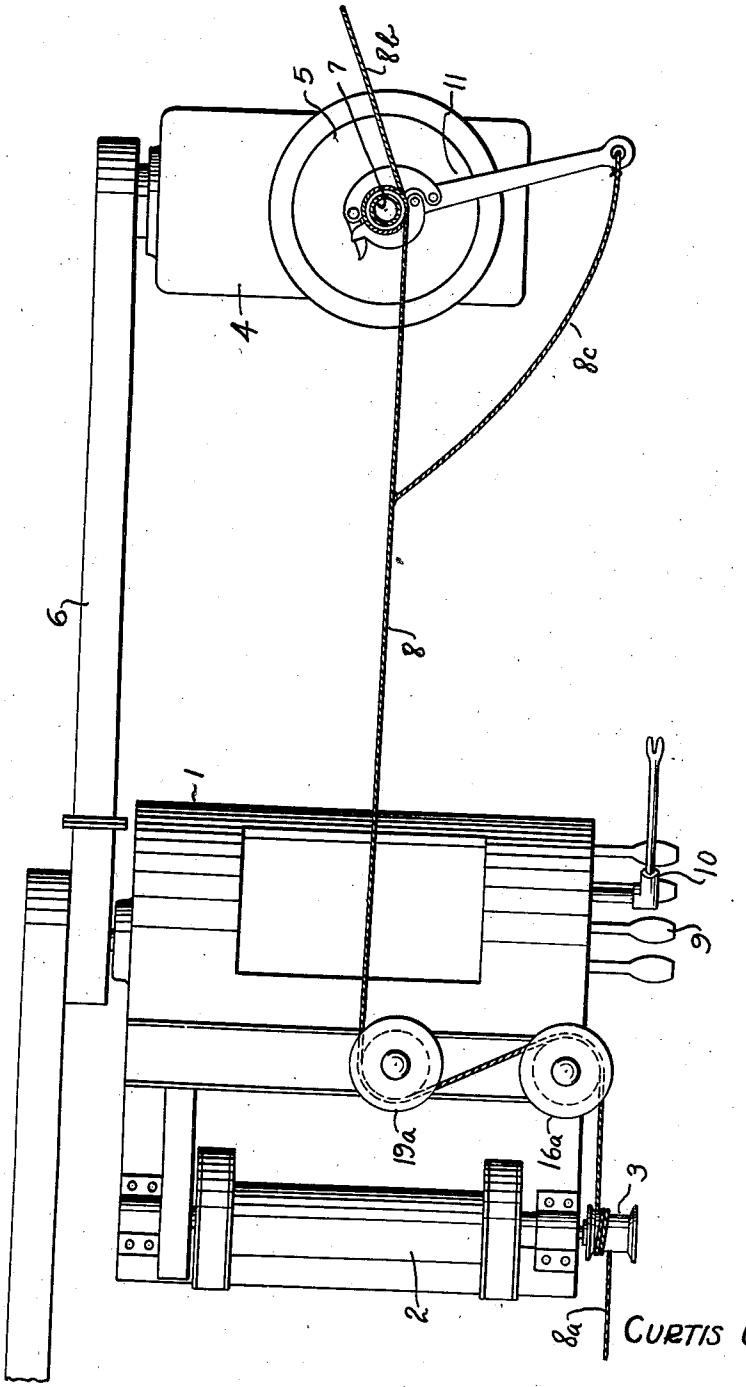


Fig. 5.

Inventor
CURTIS G. BOOKER

By

E. V. Hardway,
Attorney

Patented May 26, 1942 2,284,120

UNITED STATES PATENT OFFICE

2,284,120

SPINNING LINE GUIDE

Curtis G. Booker, Beaumont, Tex., assignor to The International Derrick & Equipment Company of Texas, Beaumont, Tex., a corporation of Texas

Application May 29, 1939, Serial No. 276,258

2 Claims. (Cl. 254—190)

This invention relates to a spinning line guide.

An object of the invention is to provide a novel type of guide for the line which is, at times, used for making up the drill stem whereby the line, when so used, will not interfere with the hoist operator, commonly known as the driller.

In the process of drilling by the rotary method a line, commonly known as a spinning line, is often used for making up the drill stem, that is, for screwing together the tool joints of the stem in connecting additional sections of the stem to the upper end of the string that has been made up. As each successive length, or section, of the drill stem is added, the made up portion of the stem is lowered into the well and suspended by means of slips with the upper end of the made up portion of the stem extending the required distance above the top surface of the rotary table. When the next section of the drill stem is picked up and swung into alignment above the upper end of the made up portion of the string one operator sets a pair of tongs on said upper end of the made up portion and the spinning line or cable is wrapped about the said suspended section by another operator, the line or cable being given a number of wraps about the suspended section. This line is extended through the guide, hereinafter more specifically described and is wrapped about the cat head of the hoist and the line is provided with a branch or fork which is fastened to the tong handle. When the line is drawn taut by an operator at each end thereof, and upon rotation of the cat head, the suspended section of the drill stem will be rotated and the threaded pin on the lower end thereof will be screwed into the box carried by the upper end of the suspended string. When the pin is screwed into the box in this way, the operator holding the end of the line at the rotary drilling machine releases the line and the tongs are then moved upwardly and engaged about the section just attached as stated and thereupon the operator at the cat head end of the line draws the line taut causing a pull to be exerted through the main line and the branch line thus operating the tong and finally tightening up the threads of the tool joint.

In a conventional drilling rig the station of the hoist operator or driller is in approximately a direct line between the cat head and the table of the rotary drilling machine and accordingly the work of the driller is interfered with by the line during the operations above explained and furthermore the hoist operator endangered in case the line should break or in case he should become entangled therein. The line guide hereinafter more specificaly described has been designed for the primary purpose of diverting the line around the station of the driller, or hoist operator, so that the line will not interfere with or endanger said operator.

Another object of the invention is to provide a line guide of the character described that may be readily mounted on the hoist framework out of the way, that is of very simple and durable construction, that may be so located as not to interfere with workmen about the rig and that is very efficient to accomplish the intended purpose.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 shows a fragmentary, side elevation of the hoist showing the line guide mounted thereon.

Figure 2 shows a fragmentary, perspective view thereof.

Figure 3 shows a sectional view of the guide,

Figure 4 shows a plan view of the drilling rig showing the line guide and spinning line in operation, and

Figure 5 shows a plan view illustrating another embodiment of the invention.

Referring now more particularly to the drawings wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates, as a whole, the draw works which embodies also the hoisting drum 2 which is rotatably mounted on the framework of the draw works and which has one end of its shaft extended, on one side and fixed on said extended end there is a drum-like cat head 3. In front of the draw works there is a rotary drilling machine 4 of any conventional type, a flat top type of drilling machine being shown. The rotary table 5 of the drilling machine is rotated from the draw works, in the usual manner, by means of a sprocket chain which, as shown, is housed within the housing 6. As is well known the rotary table 5 drives the tubular drill stem as 7 to the lower end of which the drill is attached.

In carrying on drilling operations the drill stem must often be withdrawn from the well and as it is withdrawn it is broken up into sections which are stacked in the derrick. When the drill stem is again lowered into the well the sections are screwed together one at a time and the stem, as made up, is let down into the well while making up the drill stem. The made up portion of

the string is suspended, by conventional slips, from the rotary table and the next succeeding section of the stem is then picked up and aligned over the made up string and the externally threaded pin on the lower end thereof is screwed into the internally threaded box on the upper end of the string suspended from the rotary table. In order to facilitate the screwing together of the upper section and the made up string beneath a spinning line 8 is employed. One end of this spinning line is wrapped around the cat head 3 and the free portion 8*a* thereof is held by an operator. The other end of the spinning line is wrapped about the suspended section and the free portion 8*b* thereof is held by another operator. The numerals 9 and 10 designate a brake lever and a clutch shift lever, respectively, whereby the driller may control the operations of the draw works and the hoist. These are on the same side of the draw works as the cat head and, it will be noted therefore, that the station of the hoist operator, or driller, is located in substantially a line between the cat head and the rotary table of the drilling machine.

When the section of stem to be attached to the suspended string is in readiness to be screwed up the operator holding the end 8*a* of the line will pull the line taut while the other end of the line is held by the other operator and upon rotation of the cat head 3 a pull will be exerted on the line 8 thus rotating the suspended section of the drill stem and screwing it into the box at the upper end of the made up portion of the string. A conventional type of tong as 11 is previously positioned about the upper end of the made up string suspended by the slips so as to be in readiness for use.

A branch line 8*c* is connected at one end to the main line 8 and at its other end to the free end of the tong handle. This branch line 8*c*, however, hangs slack while the pin is being screwed home as above explained but in order to tighten up the threads, as is necessary, the tong is then released and elevated and engaged about the upper section of the stem and the operator holding the end 8*a* of the line again pulls it taut and the rotation of the cat head 3 will then exert another pull through the line 8 while the end 8*b* of the line is released thus allowing a pull to be exerted through the branch line 8*c* on the tong handle thus tightening up the threads of the connected tool joint.

While carrying on this work, as above detailed, it is very desirable that the line be diverted around the station of the operator of the draw works and hoist so that the line will not be in the way of said operator, to interfere with his work and so that the safety of the operator will not be endangered. For that purpose a line guide has been provided which will now be more specifically described:

This line guide is preferably mounted on the top of the hoist framework in front of the cat head 3. This guide includes an approximately vertical plate 12 which declines from its outer end inwardly and downwardly and whose lower inner end is suitably anchored, as by welding, to the hoist framework, or secured thereto in any other preferred manner. Secured to said plate and extending forwardly and downwardly therefrom there is a plate-like leg 13 whose lower, forward end is also secured to the hoist framework in any preferable manner as by welding. Suitably secured to the upper, outer end of the plate 12 on its rear side there is an arcuate shield 14 having the rear wall 15 and within said shield there is a sheave 16 suitably mounted on a cross-spindle 17 whose ends are supported, respectively, by the plate 12 and the wall 15. The shield 14 surrounds the sheave 16 above.

Supported on the lower inner end of the plate 12 there is a shield 18 within which there is rotatably mounted a sheave 19. This sheave is mounted on the spindle 20 whose ends are supported by the upper and lower walls of the shield 18. The axes about which the sheaves 16, 19 rotate are arranged at approximately right angles to each other as more clearly shown in Figures 2 and 3. The spinning line 8 operates about the sheaves 16, 19 and as a consequence it is evident that said line will be diverted around the station where the hoist operator, or driller is located so as not to interfere with his work and so as not to endanger him.

The adjacent ends of the shield 12, 18 may be connected by a tube 21 which gives additional strength to the structure and which forms additional guiding means for the line.

In the embodiment illustrated in Figure 5 the sheaves 16*a* and 19*a* are preferably mounted on the framework of the hoist to rotate about vertical axes and, as shown, are in a substantially horizontal plane. In this embodiment the line 8 passes from the cat head around these sheaves and on to the drill stem as shown in the other figures. These sheaves are not necessarily mounted in any selected relationship to the cat head but so that the line from the cat head may pass around the sheaves and on toward the rotary table, being diverted by the sheaves around the station of the driller. In other respects, than that above pointed out, the embodiment illustrated in Figure 5 is the same as shown in Figure 4.

The drawings and description are illustrative merely, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In well drilling equipment having a hoist provided with a cat head at the side of the hoist, for operating a spinning line and a hoist-controlling means on the same side as the cat head; a spinning line guide on the hoist comprising two sheaves, and a frame including two shields for mounting the sheaves on the hoist one of the sheaves being mounted in one shield in alignment with the cat head, and the other sheave being mounted in the other shield in alignment with said first sheave and spaced inwardly toward the hoist with the axes of the sheaves in approximately right angular relation whereby the spinning line from the cat head to a point in front of the hoist will be offset by said guide around the hoist-controlling means.

2. In well drilling equipment having a hoist provided with a cat head at the side of the hoist, for operating a spinning line, and a hoist-controlling means on the same side as the cat head; a spinning line guide comprising a plurality of spaced sheaves located on the same side of the hoist as the cat head and in front of said cat head, a support for the sheaves, means for mounting the support on the hoist at an angle with respect to a plane perpendicular to the axis of the cat head and at an inward direction toward the hoist whereby the spinning line from the cat head to a point in front of the hoist will be offset around said hoist-controlling means by said line guide.

CURTIS G. BOOKER.