May 9, 1939. R. H. JACKSON 2,157,338

SPINNING ROPE PIPE TONGS

Filed March 10, 1937

FIG. 1.

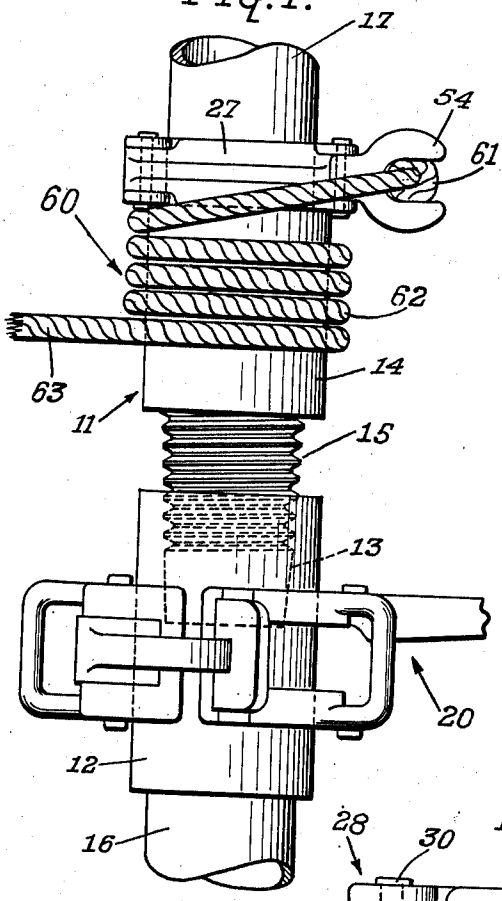


FIG. 2.

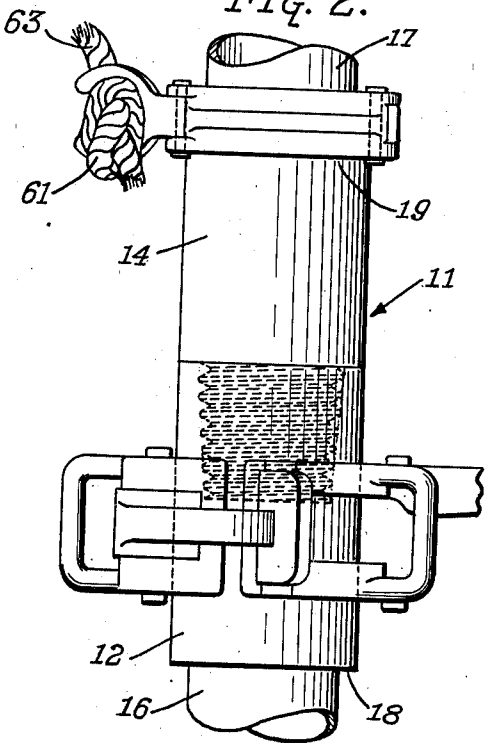


FIG. 4.

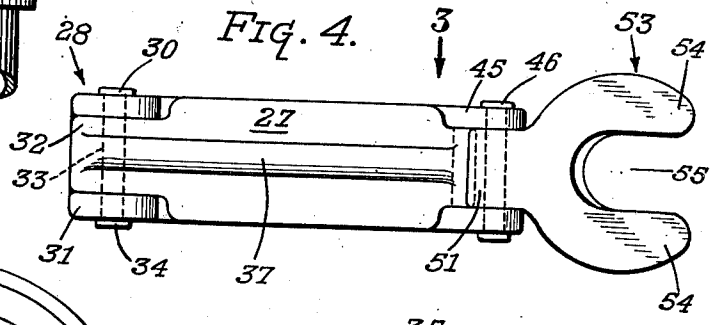


FIG. 3.

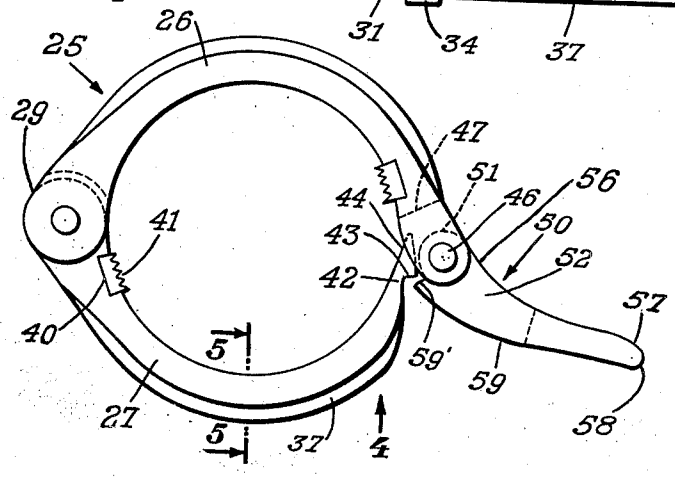
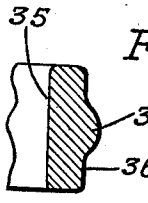


FIG. 5.



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SPINNING ROPE PIPE TONGS

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2 Claims. (Cl. 81—66)

My invention pertains to the practice of connecting and disconnecting rotary tool joints such as used in oil well drilling or the like and particularly to the manner of making and breaking the connection by what is termed spinning in the joint in which a spinning rope is used.

In the ordinary practice using a spinning rope the string of drill pipe extending downwardly in the well supported on the rotary table by slips with the lower half of the rotary tool joint above the table, rotary tool tongs are then slipped over this lower half of the joint which contains the so-called tapered box threads, the stand to be connected thereto having the upper half of the rotary tool joint at the lower end of the stand and this containing the tapered threaded pin for hoisting by the elevator and hoisting cable from one side of the derrick and swung into alignment with the drill string. Prior to lowering this stand the spinning rope is loosely coiled with four or five convolutions resting on the rotary tongs on the lower half of the tool joint. The pin threads are then engaged with the box threads, one end of the spinning rope is taken to the cathead of the draw works winch and given a twist around such cathead. The other end is held by an operator on the derrick floor after the convolutions have been lifted to engage the upper half of the tool joint. The rope is then wound in by the rotating cathead, the operator pulling on his end of the rope to develop sufficient friction to rotate or spin the stand pipe connected to the drill string; in this action the stand of pipe swivels on the swivel of the running block. After the upper half of the tool joint has been seated, the spinning rope is pulled loose from the stand, the rotary tongs are slipped up on the upper half of the tool joint and by means of a rope on the end leading to a second cathead, several quick jerks are given to properly tighten the joint.

In this former procedure there are a good many elements of danger. For instance, as it is necessary for the operator holding the rope end to wear gloves, these sometimes get caught in the rope and pull his hands into the convolutions on the tool joint. Moreover with so much loose rope on the derrick floor which is more or less slippery, there is great danger of the operator having his legs tangled. Moreover if the tool joint is covered with a film of oil, mud, or other fluid, the spinning rope will slip thereon as it is difficult to develop sufficient friction to spin the stand and even when operating properly the spinning rope coils upwardly riding off of the upper shoulder of the tool joint onto the drill pipe which develops a cutting action on the rope. This procedure in addition requires an appreciably longer time than with my invention.

A feature and characteristic of my present invention is that slippage of the spinning rope on the tool joint or stand to be spun in is absolutely prevented. It is not necessary for an operator to hold the end of the spinning rope to develop the friction and this is released when the upper half of the tool joint is spun into place. My invention is characterized by utilizing what I term spinning rope pipe tongs, such being two jaw tongs which may be quickly clamped around the upper drill pipe above the upper half of the tool joint connected to its lower end. This has a latching tongue extending laterally therefrom and an open yoke. A knot on the spinning rope is engaged in this yoke and the rope is given four or five convolutions around the tool joint. These may be placed loosely on the rotary tongs which are slipped loosely over the lower half of the joint when the string in the well hole is held stationary by the rotary table. This loose rope may then be lifted and the knot engaged in the yoke. The free end of this spinning rope is led to a cathead which on rotation coils in the rope developing a tension and tightening of the coils around the upper half of the tool joint and giving a pull on the knot and hence the latching tongue which thus increases the grip of the spinning tongs on the drill pipe. The convolutions of this spinning rope are located around the upper half of the tool joint and thus spin this into place. Moreover when the tongs are properly located on the drill pipe the knot becomes automatically released from the yoke thereby preventing bending of the latching tongue. The rotary tool tongs are then utilized to give the final jerk or tightening of the joint. With my invention also by a reverse procedure the tool joints may be opened or unspun when running a drill string out of a well.

My invention is illustrated in connection with the accompanying drawing, in which:

Fig. 1 illustrates the upper part of a drill string presumed to be suspended in a well by the rotary table and slips, the lower part of a stand to be coupled thereto, the tool joint is shown in the open position, the lower half on the drill string and the upper half on the lower end of the stand, part of a tool joint tongs is illustrated as fitting loosely on the lower half and my spinning rope tongs secured to the drill pipe of the stand resting on the upper shoulder of the tool joint, together with several convolutions of the spinning

rope on the upper half of the tool joint with the free end leading to a cathead.

Fig. 2 is an elevation similar to Fig. 1 with the upper half of the tool joint spun in place and the knot of the spinning rope in a position to free itself from the yoke on the latching arm of the spinning rope tongs, the rotary tongs still being shown in their lower position.

Fig. 3 is a plan of the spinning rope tongs taken in the direction of the arrow 3 of Fig. 4.

Fig. 4 is a side elevation taken in the direction of the arrow 4 of Fig. 3.

Fig. 5 is a detail vertical section on the line 5—5 of Fig. 3 through one of the jaws of the tongs.

In my invention the tool joint designated by the numeral 11 has a lower half 12 with a tapered box thread 13 therein and the upper half 14 with the tapered pin threads 15 on the lower end. Each of these halves of the tool joint have fine internal threads not illustrated and the drill string 16 extending downwardly in the well has the upper drill pipe tightly threaded in these fine threads of the lower half of the tool joint. In the operation of spinning or threading in a stand for running in a hole and also for running out or uncoupling the stand, the drill pipe immediately below the lower half 12 of the tool joint is held and engaged by slips in the rotary table and thus may be held stationary. The stand to be coupled to the drill string is illustrated at 17 in which the lower drill pipe of this stem is tightly threaded in the fine threads in the upper half of the tool joint. The upper end of the stand is held in the usual manner by an elevator engaging a shoulder such as 18 on the lower stand and this has a swivel connecting to the travelling sheave used for hoisting the stand from the stack and when coupled, lowering the drill string the length of the stand. The upper half 14 of the tool joint has an upper shoulder 19.

In the ordinary practice of spinning in a stand in coupling up a drill string, rotary tongs indicated by the numeral 20 are fitted loosely on the lower half 12 of the tool joint prior to aligning the stand to be connected with the drill string held stationary in the rotary table. Also it is the common practice to loosely coil the spinning rope on this lower half of the tool joint resting on the tongs 20. Then when the stand to be connected is aligned with the drill string and the threaded tapered pin 15 lowered into the box 13 until the threads engage, then the spinning rope is lifted to engage the upper half of the tool joint. One end of this coiled rope is then led to a cathead and the other end is held by an operator, the operator pulling on this to develop a friction to tightly engage the convolutions of the rope with the upper half of the tool joint and thus spin the threads 15 in the threads 13 of the box. The spinning rope is then loosened and withdrawn, the tongs 20 are then elevated to grip the upper half of the tool joint and by means of a rope leading from the lever end of these tongs to a cathead, several jerks are given on such rope to give the final clamping or seating to develop the tight tool joint.

My invention diverts from this prior practice in employing the spinning rope pipe tongs designated by the assembly numeral 25. These tongs have what may be termed a stationary jaw 26 and a movable or latching jaw 27. These are connected by a hinge 28 which has the knuckle 29 and the hinge pin 30. This knuckle is illustrated as being constructed with ears 31 on the jaw 26 and a tongue 32 on the jaw 27 interfitting with the hinge pin extending through a perforation 33 in the ears and the tongue. The hinge pin is illustrated as being upset or riveted at the ends 34. Each of these jaws has a cylindrical inner surface 35 and an approximately cylindrical outer surface 36 with a raised rib 37, this rib being for the purpose of giving additional strength.

Each of the jaws has a dove-tailed cut groove 40 extending from the top to the bottom in which is fitted toothed grippers 41, these having a tight fit in the grooves and if desired the metal of the jaws may be peened over the lower and upper ends of these gripper inserts. The clamping jaw 27 has a hook 42 providing a shoulder 43 and beyond the shoulder there is a tapered or pointed end 44. The end of the jaw 26 remote from the hinge has upper and lower ears 45 with a perforation through which a pivot pin 46 extends, these ears terminating at 47.

The latching tongue 50 has a reduced hub section 51 through which the hinge or pivot pin 46 extends, this hub fitting between the ears 45. The tongue has a considerable lateral extension 52 and a yoke 53 on the end. This yoke has the two spaced jaws 54, thus leaving a wide slot 55 for the reception of the spinning rope and the knob as hereinunder detailed. It is to be noted that the outside surface of the latching tongue has a concave curve 56 terminating in a convex curve 57 adjacent the tip end 58 of the jaws 54. The opposite side has a convex curve 59 terminating in a detent shoulder 59', this being designed to engage the shoulder 43 of the hook 42.

The spinning rope designated by the assembly 60 has a large knot 61 formed adjacent one end. The spinning rope tongs are clamped around the lower pipe of the stand 17 resting on the shoulder 19 of the upper half 14 of the tool joint 11 as shown in Fig. 1. These tongs indicated by the assembly numeral 25 are clamped in place after the stand is aligned with the drill string suspended in the well and when the pin threads 15 are first engaged in the box threads 13.

Using my invention, I follow somewhat the practice of the prior practice with the loose spinning rope, the rotary tongs 20 being loosely engaged around the lower half 12 of the stationary part of the tool joint and the spinning rope has loose convolutions resting on these tongs. When the assembly is in the position of Fig. 1 these coils or convolutions 62 are slipped upwardly on the upper half of the tool joint, the knob 61 is engaged in the yoke 53 and the free end 63 of the rope is led to a cathead. As soon as tension is developed on this rope it pulls the convolutions tight, exerts a pull on the knot 61 which forces the detent 59' on the latching tongue into tight engagement with the shoulder 43 of the notch 42. Thus the two jaws 26 and 27 force the insert grippers 41 into tight contact with the pipe of the stand to be spun into place, winding in the rope by the cathead causes a spinning of this stand, the convolutions 62 becoming unwound and there being a rotational pull on the latching tongue and hence on the spinning tongs. In fact, most of the spinning stresses are taken by these tongs and not by the friction of the rope around the upper half of the tool joint. When the tool joint becomes seated as shown in Fig. 2, when the tongs have been placed on the pipe in the proper position, the knot 61 is in such a position relative to the cathead that it readily slips out of the yoke. The operator soon learns the correct position to place these spinning tongs on the pipe so that

when the upper half is completely spun into the lower half of the tool joint, the tension on the rope from the cathead will free the knot. This is one of the purposes of having the surface **56** of the latching tongue formed concave with the convex end **57**. This really is intended to prevent accidental bending of the latching tongue. However if there are more convolutions of rope wound on the tool joint than are necessary or the pipe does not come to rest with the latching tongue in proper position to release the knot, the operator of the cathead may quickly slacken the rope loosely turned on such cathead and thus release the strain. Also he stops the rotation of the cathead and the knot may be released by hand. The spinning tongs may then be readily removed by swinging the latching tongue in a position to release the detent **59'** from the shoulder **43** of the notch **42**. The tongs may then be swung open on their hinge **28** and removed from the stand.

The rotary tongs **20** are then elevated to engage and grip the upper half **14** of the tool joint, the rope on the end of these tongs is led to a second cathead and several jerks given to complete the tightening of the joint as is the usual practice. It will therefore be seen by my invention that I materially reduce the time required to spin in joints for attaching stands to a drill string in running in a well. It is immaterial whether the tool joint has a coating of oil, slushing mud or other liquid. Moreover there is less danger to the operator on the derrick floor and the rope is saved from cutting on the upper shoulders of the tool joint as occurs in the ordinary spinning operation.

Various changes may be made in the details of the construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In spinning rope tongs in which a pair of jaws pivoted together are secured by a latch including a latching tongue having a yoke on its outer end formed of a pair of jaws spaced apart to form an outwardly opening slot and adapted to receive a rope with a knot on the end thereof, the knot being adapted to rest on the face of the latching tongue, the rope being adapted to be unwound from a tool joint or the like and when completely unwound, the rope being adapted to slip from the yoke and thereby release the latch.

2. Spinning rope tongs in which a stationary and a locking jaw are pivoted together and a latch pivotally connected to the stationary jaw interacts with the locking jaw to engage the said jaws on a pipe or the like including a latching tongue having a yoke with two spaced apart jaws leaving a slot therebetween open at its outer end, one face of the latching tongue and the jaws having a concave curve considered longitudinally of the yoke adjacent the latch pivot and a convex curve at the end of the jaws, the said face being adapted to engage the support the knot of a rope with the rope extending through the said slot whereby when the rope is completely unwound from a tool joint or the like, the rope and knot may slip from engagement with the yoke.

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