

July 26, 1960

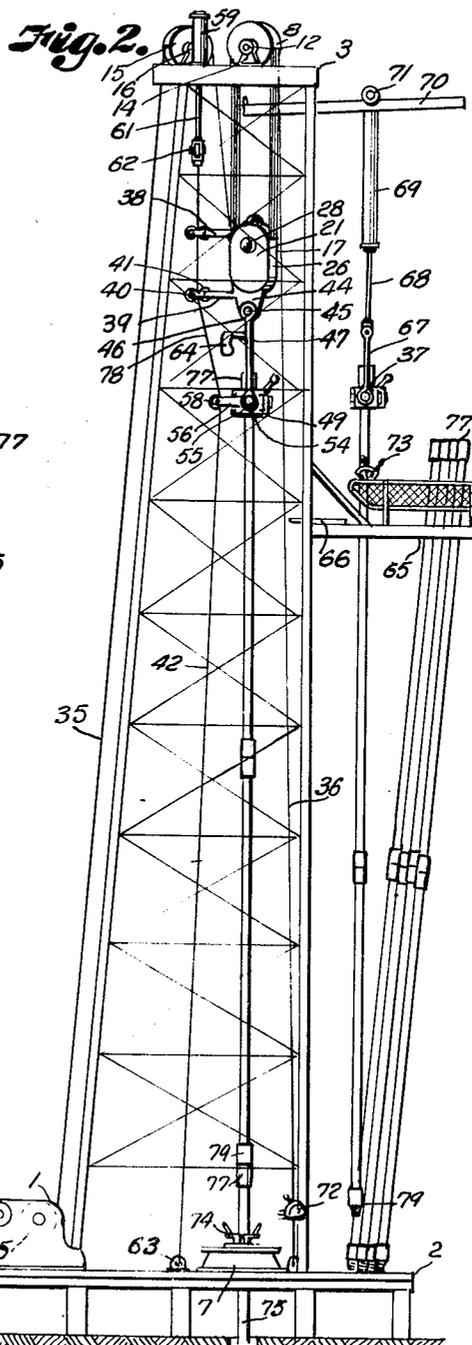
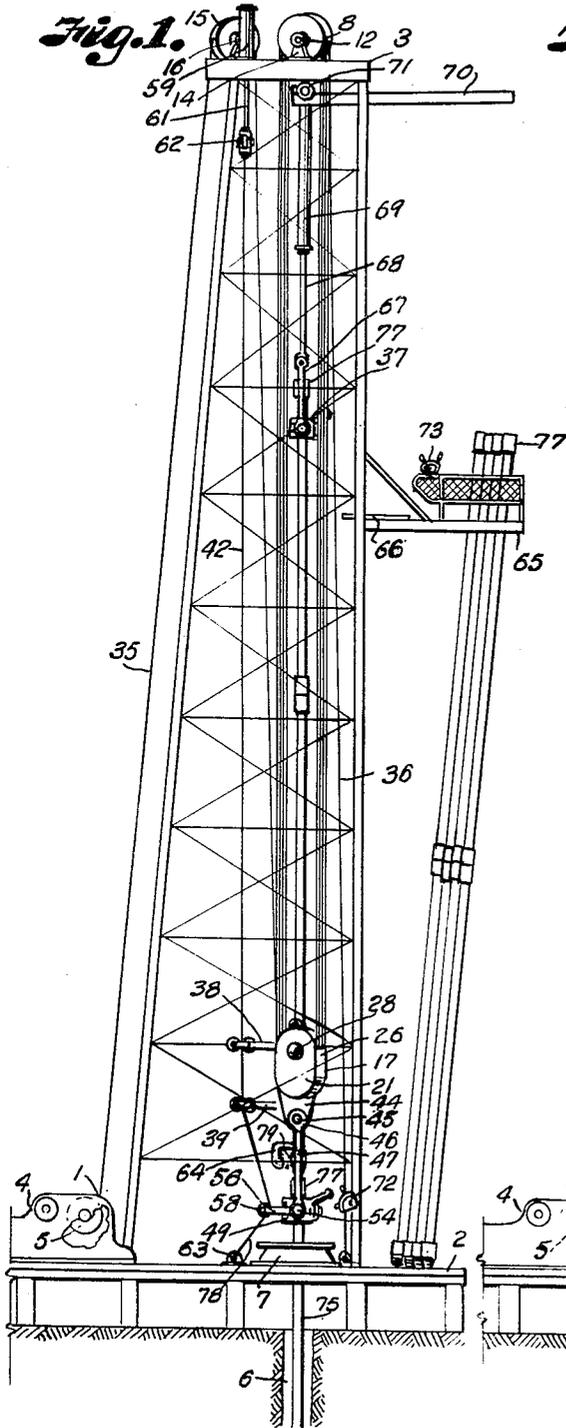
W. C. GUIER

2,946,464

APPARATUS FOR HANDLING STANDS OF PIPE

Filed July 11, 1956

2 Sheets-Sheet 1



INVENTOR.
William C Guier
BY
Paul E Mullendore
ATTORNEY

July 26, 1960

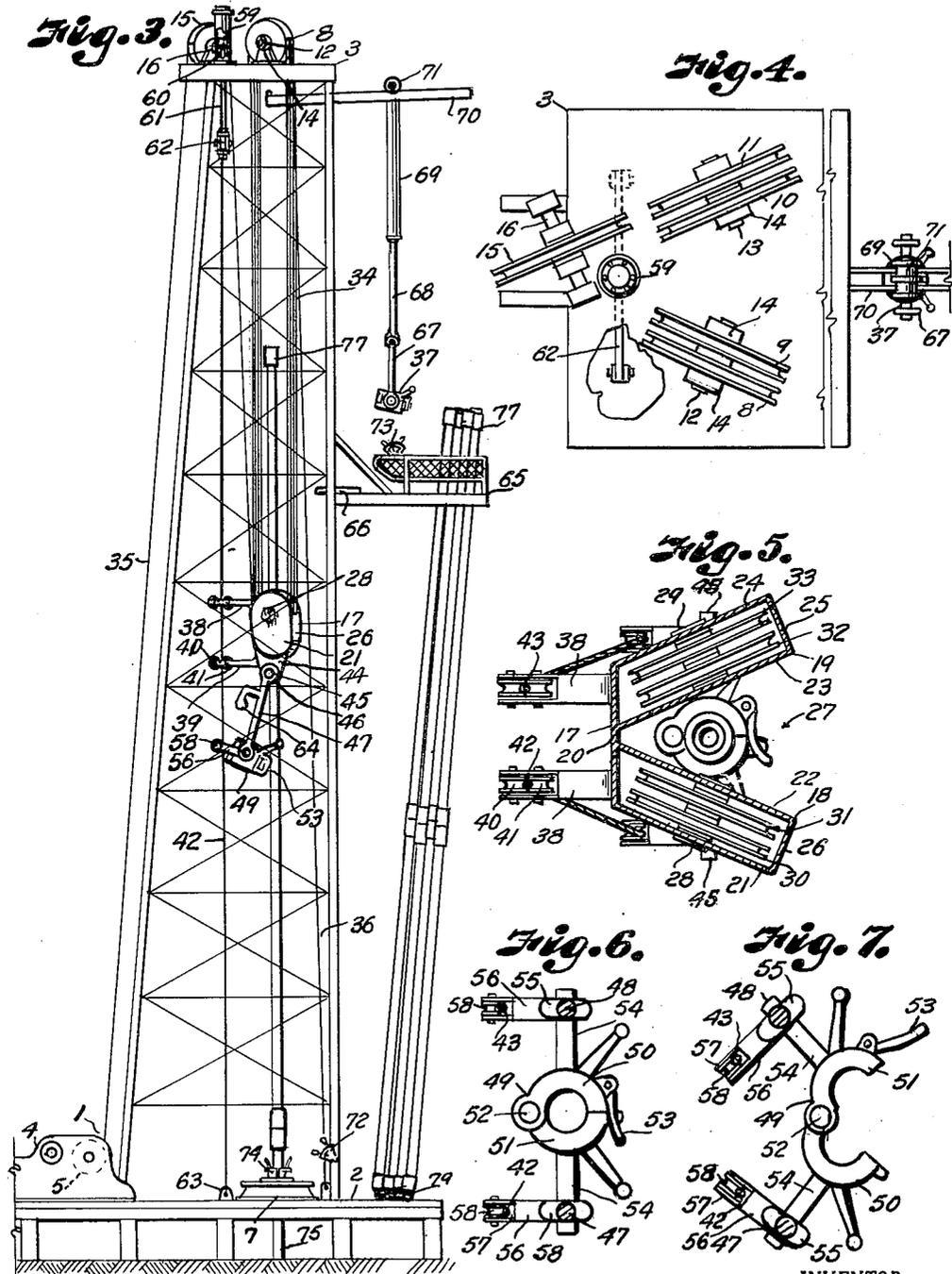
W. C. GUIER

2,946,464

APPARATUS FOR HANDLING STANDS OF PIPE

Filed July 11, 1956

2 Sheets-Sheet 2



INVENTOR.

William C. Guier.

BY

Paul E. Mullendore

ATTORNEY.

1

2,946,464

APPARATUS FOR HANDLING STANDS OF PIPE

William C. Guier, P.O. Box 7244, Tulsa, Okla.

Filed July 11, 1956, Ser. No. 597,252

10 Claims. (Cl. 214—2.5)

This invention relates to an apparatus for handling stands of pipe in a derrick or mast of a rotary drilling rig used in drilling bore holes into the earth. For example, in the rotary drilling of a well, the drill bit is connected to a string of drill pipe that is rotated by means of a turntable, and as the well deepens additional sections of drill pipe are added thereto, consequently the drilling string consists of many stands of drill pipe connected together by tool joints.

It becomes necessary from time to time, as when changing bits, to pull the drill pipe from the bore hole and to re-run the drill pipe into the bore hole to continue deepening of the bore hole. This involves substantially heavy equipment and a derrick of a height whereby the drill pipe may be lifted in the bore hole to successively uncouple the sections of drill pipe, which are shifted out of alignment with the bore hole and stood substantially vertically in a pipe rack at the side of the derrick, so that they may be conveniently positioned for return to the bore hole and successively connected together when the drilling operation is resumed.

In deep wells substantially massive equipment is necessary to handle the weight of the drill pipe. This involves a draw works and a tackle comprising crown pulleys, a traveling block, and a cable reeved over the crown pulleys and the pulleys of the traveling block, and which is wound and unwound from the winding drum of the draw works to raise and lower the drill pipe elevator. The elevator is ordinarily connected to the traveling block by a swivel hook which is also of massive character. In pulling the drill pipe, the elevator is lowered in the derrick substantially in alignment with the first section of drill pipe projecting from the turntable, so that the derrick man, on the floor of the derrick, must swing the elevator laterally and hold it out of the way as it passes the tool joint of the drill pipe. The elevator must then be swung inwardly so that it can be closed about the drill pipe below the collar of the tool joint and latched. The elevator is then raised by the tackle mechanism to lift the string of drill pipe as high as possible within the derrick and a tool joint appears above the turntable. Slips are then applied in the turntable to grip and hold the string of drill pipe in the well while breaking out and uncoupling the tool joint. The uncoupled stand or drill pipe is now suspended from the swivel hook and the derrick floor man pushes the lower end of the stand of drill pipe away from the bore hole and guides it into a position under the pipe rack while the stand of drill pipe is being lowered to bring the lower end thereof into position for support on the derrick floor. During this maneuvering of the lower end of the stand of drill pipe, a derrick man, standing in a perilous position high in the derrick, steers the upper end of the stand of drill pipe toward the pipe rack. The derrick man then opens the latch of the elevator so that the elevator swings back over the bore hole for descent to engage the next stand or section of drill pipe. This procedure continues until all of the stands of drill

2

pipe have been racked up. The operations are reversed when running the drill pipe into the bore hole.

It is obvious that the above described operations require substantial manual effort on the part of the drilling crew, are hazardous, and require a great amount of time, which is time lost from the actual deepening of the bore hole. It will also be noted that the swivel hook limits the length of the stands that can be removed.

Therefore, the principal object of the present invention is to provide an apparatus for handling drill pipe with less danger and substantially less manual effort on the part of the drilling crew, while permitting of faster operation so that less drilling time is lost when it becomes necessary to pull the drill pipe and run it back into the bore hole.

Other objects of the invention are to provide means for applying elevating forces to the elevator in laterally spaced apart vertical direction on opposite sides of the drilling string and applying a lateral pulling force on the elevator to shift the elevator away from the drill pipe for leaving the space open between the elevating forces so as to accommodate a stand of drill pipe. In this way the stand of drill pipe may be supported by a transfer elevator and coupled to or uncoupled from the drilling string while the main elevator is returned to its position for reconnection with the drilling string.

Other objects of the invention are to provide an apparatus whereby the traveling block and the elevator carried thereby are kept in constant up-and-down motion and separate from the movements for maneuvering the stands of drill pipe into and out of racking position; to provide a power mechanism operable in association with the elevating mechanism for maneuvering the stands of drill pipe into and out of racking position; to provide a power actuated means for opening the elevator and shifting it into and out of contact with drill pipe; to provide a traveling block and crown pulley structure wherein the runs of the tackle do not interfere with the power mechanism for maneuvering the stands of drill pipe; and to provide for guiding the up-and-down movement of the traveling block and controlling the position of the elevator carried thereby.

In accomplishing these and other objects of the invention as hereinafter pointed out, I have provided improved apparatus, the preferred forms of which are illustrated in the accompanying drawings wherein:

Fig. 1 is a diagrammatic elevation of a derrick equipped with a pipe handling apparatus in accordance with the present invention, and showing the tackle or hoisting apparatus in position with the elevator engaging the string of drill pipe while a disconnected stand of drill pipe is ready to be shifted under power into racking position.

Fig. 2 is a similar view but showing the string of drill pipe lifted, the slips of the turntable set, and the main elevator ready for release from the pipe to permit the main elevator to start its downward movement and the transfer elevator to move into position to engage the stand of drill pipe.

Fig. 3 is a similar view but showing the main elevator after it has been released and is descending to engage another stand of drill pipe, and showing the transfer elevator moved into position for supporting the stand of drill pipe while the tool joint is being uncoupled for transfer of the stand of drill pipe into the pipe rack.

Fig. 4 is a plan view of the top of the derrick showing the arrangement of the crown pulleys, the control cylinder, and the transfer mechanism.

Fig. 5 is a horizontal section through the traveling block to better illustrate the relative position of the pulleys therein and whereby the runs of cable are kept out of the way of the transfer elevator.

Fig. 6 is a horizontal section taken through the links

3

of the main elevator and showing the elevator in closed position.

Fig. 7 is a similar view showing the main elevator in open position.

Referring more in detail to the drawings:

1 designates a rotary drilling rig including a platform 2, a derrick 3 extending above the platform, and a draw works 4 mounted on the platform at one side of the derrick and having a winding drum 5. Also positioned on the derrick floor in front of the draw works and concentrically with an extended axis of the bore hole 6 is a turntable 7 which is driven from the draw works to rotate a string of drill pipe. Mounted on the top of the derrick is a crown pulley assembly having sets of pulleys 8—9 and 10—11 that are carried on angularly disposed shafts 12 and 13 which are mounted in bearings 14. The shafts 12 and 13 are spaced from each other and are disposed with the axes thereof substantially intersecting the extended axis of the bore hole 6, as shown in Fig. 4. Also mounted on the top of the derrick at the side thereof nearest the draw works is a pulley 15 that is carried on a transverse shaft 16.

Suspended from the angularly disposed crown pulleys is a main traveling block 17. The traveling block 17 has casing sections 18 and 19 arranged at an angle corresponding to the angular relationship of the pairs of crown pulleys previously described. The casing sections 18 and 19 have a common side wall 20 and spaced apart diverging walls 21—22 and 23—24 and which are connected opposite the wall 20 by walls 25 and 26, as shown in Fig. 5. The adjacent walls 22 and 23 of the casing form a V-shaped space 27 therebetween substantially corresponding to the V-shaped space between the adjacent crown pulleys 9 and 10. Mounted within the sections of the casing and carried by the side walls thereof are shafts 28 and 29, and mounted on the respective shafts are pairs of pulleys 30—31 and 32—33 to cooperate with the crown pulleys for reeving a main cable 34 having one end 35 wound on the winding drum 5 of the draw works and the other end is dead-ended to the derrick platform, as indicated at 36. When the cable 34 is reeved over the angularly disposed pulleys, the runs thereof intermediate the crown and traveling block pulleys operate in diverging planes substantially parallel with the planes of the side walls of the traveling block, with the result that the traveling block and lines of the cable form a space to accommodate a stand of drill pipe and traveling block and suspending lines of the cable 34 may move down the sides of a stand of drill pipe. The space also permits a transfer elevator 37 to be moved into position to engage the stand of drill pipe, as later to be described.

Extending laterally from the wall 20 of the traveling block casing and spaced apart thereon are upper and lower pairs of arms 38—39 (Fig. 5), and carried in the outer end of each arm are spaced apart guide pulleys 40—41 for passing pairs of cables 42 and 43. The cables 42 and 43 depend within the derrick to guide the traveling block during its travel up and down the derrick and to prevent swinging thereof that might be hazardous to the drillers. Extending laterally from downward extensions 44 of the side walls of the traveling block casing are arms 45 for passing eyes 46 of bails 47 and 48 of a main elevator 49.

The main elevator 49 may be of standard design in that it includes collar portions 50 and 51 hinged together at one side by a hinge pin 52 and at the opposite side by a latch 53. Extending from the collar portions are arms 54 journaled within eyes 55 on the lower ends of the bails 47 and 48, as shown in Figs. 6 and 7. Extending from the eye 55 of each bail is an arm 56 terminating in a fork 57 carrying pulleys 58 for retaining the cables 42 and 43 therein. When the main elevator 49 is closed, the arms 56 are spaced apart a greater distance than the spacing between the pairs of guide pulleys on the traveling block and when the elevator is open the cables are brought together substantially conforming to the spacing

4

of the cables where they pass between the pairs of guide pulleys 40 and 41 on the arms 38 and 39 of the traveling block, for a purpose later described.

Carried on the top of the derrick is a power cylinder 59, and slidable therein is a piston 60 which is connected to a depending rod 61. The rod 61 carries a transverse bar 62 to which the upper ends of the cables 42 and 43 are connected. The lower ends of the cables 42 and 43 are connected with suitable anchors 63 on the derrick platform 2, as shown in Figs. 1, 2 and 3. The bails 47 and 48 of the elevator 49 are preferably provided with weights 64 extending laterally therefrom to tilt the collar portions 50 and 51 of elevator toward the drill pipe, as later to be described.

The derrick also includes a racking platform 65 extending laterally therefrom and which carries the fourble board 66 on which the derrick man stands to effect release of the latch of the main elevator and to connect the transfer elevator 37.

The transfer elevator 37 has bails 67 suspended from a piston rod 68 of a hoisting cylinder 69 which is carried on a track 70. The track 70 is fixed to the top of the derrick 3 and has its outer end sloping upwardly away from the derrick while the inner end of the track slopes downwardly toward the extended axis of the bore hole. If desired, the track may be pivotally connected to the derrick to reverse the slope thereof for facilitating movement of a trolley 71 therealong in either direction. The hoist cylinder is suspended from a trolley 71 that is movable along the track for carrying the transfer elevator from a position over the axis of the bore hole to a position over the pipe racking platform 65.

Dual controllers 72 and 73 may be provided for the hoist cylinder 69 of the transfer elevator 37 and the power cylinder 59. These controls may be located in reach of the derrick floor man and the derrick man on the fourble board 66, so that either man may operate them.

In operating the drill pipe handling apparatus constructed as described, and in accordance with the improved method of the present invention, the derrick man takes his position on the fourble board 66 and a second man takes his position on the derrick floor to operate the slips 74 and controller 73. Assuming that the string of drill pipe 75 is to be pulled from the bore hole and that the Kelley rod which is connected with the upper end of the drill pipe to provide a driving connection with the turntable 7 has been removed, the first stand of drill pipe is projecting above the turntable and the drill pipe is supported by the slips 74 in the turntable 7. The traveling block 17 is lowered to a position where the main elevator 49 can be closed about the projecting end of the pipe to engage the collar on the box end 76 of the tool joint, as shown in Fig. 1. During these operations the main elevator control cables 42 and 43 are sufficiently slack to permit the elevator to engage the drill pipe with the aid of the weights 64 on the bails 47 and 48. The floor man then closes and latches the main elevator 49 on the drill pipe. After the elevator 49 is latched, the winding drum 5 of the draw works 4 is actuated to raise the traveling block 17, releasing the slips 74 and lifting the entire string of drill pipe to the top of the derrick. During upward movement of the traveling block 17, the guide pulleys 40 and 41 merely move along the cables 42 and 43. When the string of drill pipe has been lifted to the position shown in Fig. 2, the slips 74 are replaced to support the string of drill pipe by the turntable 7. The derrick man on the fourble board 66 of the racking platform 65 then releases the latch of the main elevator 49, after which the power cylinder 59 is actuated by shifting the lever of one of the controllers 72 or 73 to tighten the cables 42 and 43 so as to straighten out the bights 78 in the cables between the anchors 63 and the guide pulleys 41 on the lower arms 39 of the traveling block 17. This action of

5

the cables 42 and 43 opens the main elevator 49, as shown in Fig. 7. The traveling block is now ready for immediate descent to engage the next stand of drill pipe. This is effected by reversing the winding drum 5 of the draw works 4 to permit the traveling block 17 and main elevator 49 to drop at a rate of speed controlled by the winding drum 5 of the draw works 4. Due to the arrangement of the crown pulleys 8—9 and 10—11 and the construction of the traveling block 17, the traveling block 17 may drop downwardly over the sides of the stand of drill pipe, as shown in Fig. 3. The transfer elevator 37 is now moved into position by the derrick man on the racking platform to engage the stand of drill pipe below the collar of the box end of the tool joint. As soon as the transfer elevator connection is made, fluid is admitted to the hoist cylinder 69 to support the stand of drill pipe, while the tool joint at the end of the stand of pipe is broken loose and unscrewed from the drilling string that is supported by the slips 74. When the main elevator 49 reaches the position shown in Fig. 1, it is again engaged with the drilling string to lift the drilling string for removal of another stand of drill pipe. By this time, the derrick man on the fourble board 66 has shifted the previously uncoupled stand of drill pipe out of position. This is easily effected by the trolley 71 moving along the track 70 into the pipe rack. The stand of drill pipe is then lowered by the hoist so that the pin end 79 of the tool joint rests upon the derrick platform 2. The derrick man then unlatches the transfer elevator 37 and draws the upper end of the stand of drill pipe therefrom so that the pipe may be located in the pipe rack 45. By this time the traveling block 17 is lifting the next stand of drill pipe to the position where it may be uncoupled and racked as just described.

In re-running the stands of drill pipe into the bore hole 6, the operations are reversed. The new drill bit is set in the turntable, and the transfer elevator 37 is now used to lift the first stand of drill pipe from the rack and transfer it to a position over the turntable 7, where it is coupled with the stem of the drill bit. The traveling block is actuated to carry the main elevator into position to engage the stand of drill pipe and lower it into the bore hole 6 by means of the draw works 4. The power cylinder 59 is actuated to slack off the cables 42 and 43, after which the main elevator 49 is closed about the pipe and the stand of pipe is lowered into the bore hole 6. When the tool joint on the upper end thereof reaches a position above the turntable 7, the slips 74 are set to support the stand of pipe in the bore hole. The main elevator 49 is then disengaged from the stand of drill pipe and the elevator 49 is drawn away from the pipe by operating the cylinder 59 to again tighten the control cables 43 and 44, as shown in Fig. 3. The winding drum 5 is then reversed to lift the main elevator 49 to the top of the derrick ready to engage the next stand of drill pipe, which has been moved into position by the aid of the transfer elevator 37. After coupling the second stand of drill pipe and removal of the transfer elevator 37 therefrom, the main elevator 49 is closed about the drill pipe, after which the pipe is lifted to remove the slips 74 and the drill pipe is then lowered into the bore hole 6 under control of the draw works 4. The operations continue as above described until all of the stands of drill pipe have been connected into the drilling string. It is obvious that the arms 45 which project from the side walls of the traveling block 17 provide means on which the bail parts 47 and 48 of the elevator 49 are adapted to swing on a horizontal axis with very little relative motion in a rotary direction. This is an important feature, because the opening side of the elevator is kept in the same direction, due to the fact that there is substantially no tendency of the traveling block to turn during its up and down movement in the derrick. This is because of the relatively rigidity afforded by the runs of the tackle cable. Thus the opening side of the pipe

6

gripping or collar part of the elevator is maintained in a fixed direction for access to the latch mechanism and to receive the pipe. However, the elevator is free to swing in the one transverse direction under control of the cable means 42 and 43 whereby the pipe-engaging part of the elevator is moved into and out of registry with the center line of the bore hole.

From the foregoing it is obvious that I have provided an apparatus for handling drill pipe with less danger and substantially less manual effort on the part of the drilling crew, while permitting faster operation so that less drilling time is lost when it becomes necessary to pull the drill pipe and run it back into the bore hole. It is also obvious that I have provided a traveling block and pulley arrangement which permits a substantially constant up-and-down motion of the traveling block and main elevator, while the transfer elevator is handling the stands of drill pipe to and from racking position.

What I claim and desire to secure by Letters Patent is:

1. In an apparatus for handling a drilling string in a derrick, the combination of a traveling block having diverging pulley portions to provide a space therebetween to accommodate the drilling string therein, a pair of cables extending vertically of the derrick and having one of their ends fixed to a stationary part on the derrick and their other ends fixed to a movable part on the derrick, arms projecting from the traveling block and slidably connected with said cables, an elevator having pivotally connected collar portions adapted to close on the drilling string, bails pivotally suspending the elevator from the traveling block, arms extending from the collar portions and slidably connected with the cables, said last named arms being positioned relatively to the arms of the traveling block to form bights in said cables between the said arms, and means for actuating said movable part to tighten the cables for causing said bights to swing the collar portions of the elevator apart and to swing the elevator retractively out of alignment with said space between the diverging portions of the traveling block.

2. In an apparatus for handling a drilling string in a derrick, the combination of a traveling block having diverging pulley portions to provide a space therebetween to accommodate the drilling string therein, an elevator pivotally suspended from the traveling block, a power cylinder on the derrick, a pair of spaced apart cables extending vertically of the derrick and connecting the power cylinder with a fixed part of the derrick, arms projecting from the traveling block and slidably connected with said cables, said elevator having pivotally connected collar portions adapted to close on the drilling string, arms extending from the collar portions and slidably connected with the cables, said last named arms being positioned relatively to the arms of the traveling block to form bights in said cables between the arms of the traveling block and the fixed end of the cables, and means for operating the power cylinder to tighten the cables for causing said bights to swing the collar portions of the elevator apart and to swing the elevator retractively out of alignment with said space between the diverging portions of the traveling block.

3. In an apparatus for handling drill pipe including a derrick, a traveling block, means suspending the traveling block from the upper portion of the derrick and for raising and lowering the traveling block in the derrick, an elevator pivotally suspended from the traveling block and having hinged sections adapted to open and close upon a drill pipe, cable means extending from the upper portion of the derrick to a lower portion of the derrick for guiding the traveling block in said raising and lowering movement, arms on the elevator sections and connected with the cable means, and means connected with the cable means for pulling on said arms of the elevator sections for swinging the elevator sections to open position and for moving the elevator on its pivotal connection with the traveling block and out of vertical alignment with the traveling block.

4. In an apparatus for handling drill pipe including a derrick, a traveling block, means suspending the traveling block from the upper portion of the derrick and for raising and lowering the traveling block in the derrick, an elevator pivotally suspended from the traveling block and having hinged sections adapted to open and close upon a drill pipe, laterally spaced apart cables, means for anchoring upper and lower ends of the cables in offset relation with said traveling block suspending means, means on the traveling block and having a slidable connection with said cables to retain the cables in relatively fixed relation with respect to the traveling block, arms projecting from the sections of the elevator and having connections with the cables to cooperate with said means on the traveling block and with the cable anchoring means in forming bights in said cables, and means connected with the cables for tensioning the cables between said anchoring means to open the elevator sections and to swing the elevator out of vertical alignment with respect to the traveling block.

5. An apparatus for handling pipe, including a derrick, a traveling block, a tackle for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, means pivotally connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis, cable means having connection with upper and lower portions of the derrick offset laterally from the extended center line of the bore hole on one side of said horizontal axis, guide means on the traveling block for movement along said cable means to maintain a substantially fixed relationship between the cable means and the traveling block during up and down movement of the traveling block, guide means attached to said bail parts of the elevator and engaged with the cable means to cooperate with the guide means on the traveling block to provide a bight in the cable means when the pipe-engaging part of the elevator is in registry with the center of the bore hole, and means connected with the cable means for pulling upon said cable means to reduce said bight and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the extended center line of the bore hole.

6. An apparatus for handling pipe, including a derrick, a traveling block, a tackle for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, means pivotally connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis, cable means having connection with upper and lower portions of the derrick offset from an extended axis of the bore hole on one side of said horizontal axis, guide means on the traveling block for movement along said cable means to maintain a substantially fixed relationship between the cable means and the traveling block during up and down movement of the traveling block, guide means attached to said bail parts of the elevator and engaged with the cable means to cooperate with the guide means on the traveling block to provide a bight in the cable means when the pipe-engaging part of the elevator is in registry with the axis of the bore hole, means connected with the cable means for pulling on said cable means to reduce said bight and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the extended center line of the bore hole, said bail parts being weighted so as to swing by gravity on said horizontal axis for returning the pipe-

engaging part into registry with the center of the bore hole upon release of pull on said cable means.

7. An apparatus for handling pipe, including a derrick, a traveling block, a tackle for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, means pivotally connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis, a cable having connection with upper and lower portions of the derrick in laterally offset relation with the extended center line of the bore hole on one side of said horizontal axis, guide pulleys on the traveling block for movement along said cable to maintain a substantially fixed relationship between the cable and the traveling block during up and down movement of the traveling block, a pulley carried by each of said bail parts of the elevator and engaged with the cable to cooperate with the guide pulleys carried by the traveling block to provide a bight in the cable when the pipe-engaging part of the elevator is in registry with the center of the bore hole, and means connected with the cable for exerting pull on said cable to reduce the bight therein and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the axis of the bore hole.

8. An apparatus for handling pipe, including a derrick, a traveling block, a tackle for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, means pivotally connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis, a cable having connection with upper and lower portions of the derrick in laterally offset relation with the extended center line of the bore hole on one side of said horizontal axis, guide pulleys on the traveling block for movement along said cable to maintain a substantially fixed relationship between the cable and the traveling block during up and down movement of the traveling block, a pulley carried by each of said bail parts of the elevator and engaged with the cable to cooperate with the guide pulleys carried by the traveling block to provide a bight in the cable when the pipe-engaging part of the elevator is in registry with the center of the bore hole, means connected with the cable for exerting pull on said cable to reduce the bight therein and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the axis of the bore hole, said bail parts being weighted so as to swing by gravity on said horizontal axis for returning the pipe-engaging part into registry with the center of the bore hole upon release of the pull on said cable.

9. An apparatus for handling pipe, including a derrick, a traveling block, a cable for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, arms extending laterally from opposite sides of the traveling block, said bail parts having eye portions engaged over the arms for connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis provided by said arms, cable means having connection with upper and lower portions of the derrick offset from an extended axis of the bore hole on one side of said horizontal axis, guide means on the traveling block for movement along

9

said cable means to maintain a substantially fixed relationship between the cable means and the traveling block during up and down movement of the traveling block, guide means attached to said bail parts of the elevator and engaged with the cable means to cooperate with the guide means on the traveling block to provide a bight in the cable means when the pipe-engaging part of the elevator is in registry with the axis of the bore hole, and means connected with the cable means for pulling on said cable means to reduce said bight and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the extended center line of the bore hole.

10. An apparatus for handling pipe, including a derrick, a traveling block, a table for suspending the traveling block from the upper portion of the derrick for raising and lowering the traveling block in the derrick with respect to a bore hole, an elevator having bail parts and a pipe-engaging part pivotally connected with the bail parts for encircling a pipe to be raised and lowered in the bore hole, arms extending laterally from opposite sides of the traveling block, said bail parts having eye portions engaged over the arms for connecting said bail parts of the elevator with the traveling block for swinging of the bail parts on a horizontal axis provided by said arms, cable means having connection with upper and lower portions of the derrick offset from an extended axis of the bore hole on one side of said horizontal axis,

10

guide means on the traveling block for movement along said cable means to maintain a substantially fixed relationship between the cable means and the traveling block during up and down movement of the traveling block, guide means attached to said bail parts of the elevator and engaged with the cable means to cooperate with the guide means on the traveling block to provide a bight in the cable means when the pipe-engaging part of the elevator is in registry with the axis of the bore hole, means connected with the cable means for pulling on said cable means to reduce said bight and effect swinging movement of the bail parts on said horizontal axis for shifting the pipe-engaging part of the elevator away from the extended center line of the bore hole, said bail parts being weighted so as to swing by gravity on said horizontal axis for returning the pipe-engaging part into registry with the center of the bore hole upon release of pull on said cable means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,354,217	Mullinix et al.	July 25, 1944
2,531,930	Woolslayer et al.	Nov. 28, 1950
2,643,005	De Jarnett	June 23, 1953
2,684,166	De Jarnett	July 20, 1954
2,734,718	Minor	Feb. 14, 1956
2,735,556	Stone	Feb. 21, 1956
2,742,260	Patterson	Apr. 17, 1956