United States Patent [19]

Funk

[54] PORTABLE WELL PIPE PULLER

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[45] Mar. 18, 1975

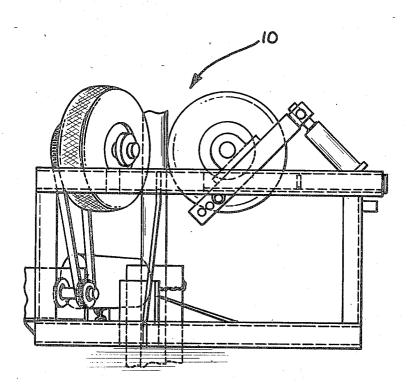
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[57] ABSTRACT

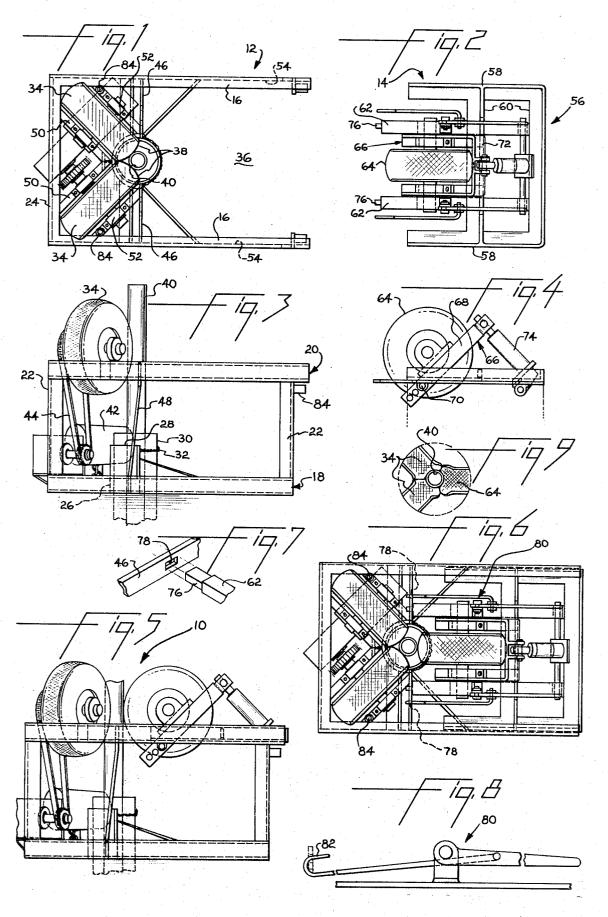
A portable well pipe puller includes a U-shaped base open on one side and carrying a pair of pipe-engaging pneumatic wheels. A third pipe-engaging wheel is mounted on a removable support engageable between the legs of the frame with the pipe confined between all three wheels. Means are provided to bias the wheel on the support toward the wheels on the frame to tightly confine the pipe between the three wheels and to rotate one of the wheels and thereby pull the pipe from the well or lower the pipe into the well.

6 Claims, 9 Drawing Figures



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PORTABLE WELL PIPE PULLER

This invention relates to apparatus for pulling well pipe, whether plastic or metal, from a well casing or for putting pipe into the casing. Conventionally, wells are lined with a relatively large diameter metal casing. A 5 smaller diameter well pipe is lowered into the casing down to the level of water in the well. Frequently, a pump is mounted on the lower end of the well pipe and submerged in the well for pumping water up through the well pipe. The well pipe is long, heavy, and difficult 10 to handle, especially when a pump is attached to the lower end.

The invention is directed to a portable and readily movable well pipe puller including a U-shaped base which is open on one side and is readily attached to the 15 casing of the well, thus locating the pipe-engaging wheels on the base with respect to the well pipe in the casing. The wheels are mounted on the base at an angle to define a pipe-receiving recess between the wheels facing the opening in the base. When the base is se- 20 cured to the casing of the well, the well pipe in the casing extends into the recess between the two wheels.

A third well pipe-engaging wheel is carried on a support member engagable with the base to close the opening after the base has been positioned and secured 25 to the casing. The support member extends into channels provided on the interior edges of the arms of the base defining the opening and is securely locked to the base. The wheel on the support may be moved toward the wheels on the base to confine the pipe tightly be-30 tween the three pulling wheels. A drive mechanism is provided to rotate one of the wheels to pull the pipe from the well, or alternatively, to lower the pipe gradually into the well.

The present well pipe puller represents a marked im- 35 provement over conventional pullers in that its twopart construction enables the operators to easily locate the base with respect to the casing and secure the base to the casing, thus locating the well pipe with respect to the pulling wheels on the base. The open end of the 40base facilitates the movement of the base around the casing to the proper position. Well pipe extending from the casing is automatically positioned in the recess between the wheels on the base. After the base has been secured to the casing, then the support carrying the ⁴⁵ third wheel may be positioned between the two legs on the base and secured to the base prior to movement of the third wheel toward the pipe to confine the pipe between the three wheels. Thus, it is possible to mount 50 the present well pipe puller on a well in which the pipe extends above the casing.

U.S. Pat. No. $3,376,9\overline{3}3$ discloses a well pipe puller in which the pipe is moved by a pair of tires, but does not show the features of the present invention.

Other objects and features of the invention.⁵⁵ come apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings illustrating the invention, of which there is one sheet.

IN THE DRAWINGS

FIG. 1 is a top view of the base of a well pipe puller according to the invention;

FIG. 2 is a top view of the support of the well pipe $_{65}$ puller;

FIGS. 3 and 4 are side views of FIGS. 2 and 3 respectively;

FIG. 5 is a side view of the well pipe puller with the base and support assembled in the work position;

FIG. 6 is a top view of FIG. 5;

FIG. 7 and FIG. 8 are views of features of the puller illustrated in FIG. 6; and

FIG. 9 is an enlarged view illustrating engagement between the pulling wheels and the well pipe.

As illustrated in the drawings, well pipe puller 10 includes a U-shaped base 12 and a removable support 14 positionable between the legs 16 of the base. The base is open at one side and includes upper and lower Ushaped frame members 18 and 20 positioned one above the other and interconnected by vertical posts 22 at each corner of the base as illustrated in FIG. 1. Legs 16 are joined by a frame member 24 to form the upper member 20. A brace 26 extends between the legs of the lower member 18 and includes a semi-cylindrical concave channel 28 equidistant between the sides of the base and dimensioned to fit around the exterior surface of a well casing 30. One end of a locking chain 32 is permanently secured to one side of channel 28. The other end of the chain may be secured to the other side of the channel 28 to confine casing 30 to the base.

A pair of pipe pulling wheels 34 are mounted on the upper frame member 20 away from the supportreceiving opening 36 and between legs 16. The wheels 34 are positioned so that the pipe-engaging surfaces 38 define a diverging recess facing in the direction of opening 36 and positioned above the channel 28 so that when the base 12 is secured to the casing 30, a well pipe 40 in the casing extending above the upper end of the casing is positioned in the recess between the wheels 34.

An electric motor 42 is connected to one pulling wheel 34 through a suitable drive 44 so that upon actuation of the motor, the wheel is rotated either in a direction to remove pipe 40 from the casing or to lower the pipe into the casing.

The frame supporting the wheels 34 includes bars 46 extending inwardly from legs 16, supports 48 extending from the ends of the bars 46 down to the cross frame 26, and bearing supports 50 and 52. The legs 16 are channeled to provide inwardly facing grooves 54.

The support 14 includes a platform 56 having a pair of side rails 58 and a pair of rungs 60 joining the rails. A pair of wheel support bars 62 are joined to rungs 60 and extend from the rungs parallel to the rails 58 and beyond the free ends of the rails. Pipe-engaging wheel 64 is journeled in bearings mounted on a pivot assembly 66 comprising a pair of bars 68 pivotally mounted at one end to the bars 62 at 70 and connected at the other end to a cross member 72 secured to the piston rod of a hydraulic cylinder 74. The cylinder 74 is pivotally mounted on a shaft extending between bars 62. Extension of the cylinder 74 rotates the assembly 68 so that the wheel 64 is moved away from rungs 60.

When the well pipe puller 10 is in use the support 14 is mounted in base 12 by sliding rails 58 into the grooves 54 of legs 16. When the support is properly positioned in the base, the pins 76 on the ends of bars 62 extend into locating holes 78 in bars 46, as illustrated in FIG. 7. When the support is properly positioned in the base and the pins 76 are in holes 78, a pair of overcenter toggle clamps 80, best illustrated in FIGS. 6 and 8, are opened and the hooks 82 on the ends of the clamps are positioned in holes 84 in bars 46. The clamps are then closed to secure the support to the base in the work position. In this position the well pipe 40 is confined between the three pipe-engaging wheels 34, 34, and 64. The cylinder 74 may then be extended to force wheel 64 against the pipe thereby increasing the friction between all of the wheels (see FIG. 9) and 5 the pipe and the motor 42 may be actuated to either raise or lower the pipe 40 in the casing 30.

The portable pipe well puller 10 is relatively light weight and is readily movable by hand so that it can be positioned in the bed of a pick-up truck for transportation to a well. A trailer is not required. At the well site, the support 14 is removed from base 12 and the base is positioned around the casing 30 as illustrated in FIGS. 1 and 3 with the casing resting against the interior surface of channel 28. Final positioning of the base 15 may be facilitated by pipes inserted in sockets 84 in the base. The chain 32 is then tightened around casing 30 so that the base is secured in position and pipe 40 in the casing extends into the recess between the treads of the the pipe 40 is moved through the opening 36 between legs 16 which is subsequently occupied by support 14.

After the base has been mounted on the casing 30, support 14 is slid into the opening 36 with rails 58 in channels 54 and pins 76 extending into holes 78. The 25 clamps 80 are then secured to hold the support in place. The retracted cylinder 74 is then extended to move the pipe-engaging wheel 64 toward the pipe and secure the pipe 40 tightly between the three wheels 34 gagement with the pipe as illustrated in FIG. 9, thereby increasing the frictional engagement between the wheels and the pipe.

With the wheels tightly engaging the pipe, the pipe is to rotate wheel 34 in the desired direction. After completion of the pipe pulling or lowering operation, the puller 10 is removed from the well by reversing the steps previously described.

The hydraulic cylinder 74 moves wheel 64 toward 40 and away from the pair of wheels 34 on base 12 so that pipes 40 of varying diameter may be secured between the three wheels. Thus, the puller 10 is readily adaptable to pulling various diameter pipes from well casings.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall 50 wheels, and drive means for rotating said wheels to within the purview of the following claims.

What I claim as my invention is:

1. A well pipe puller comprising a U-shaped base having opposed legs defining an opening on one side of the base, attachment means on the base for securing 55

the base to a well casing, and a wheel on the base having a well pipe-engaging surface facing said opening and positioned above said attachment means; and a support separable from said base having opposed edges extending along and removably mountable on said legs to close said opening, and a wheel rotatably mounted on said support having a well pipe-engaging surface: locking means for securing said support and base together with the pipe-engaging surface of the wheel on 10 the support above the attachment means on the base; and means for moving one wheel toward the other wheel to confine the pipe between the wheels and drive means for rotating one of said wheels to move the pipe relative to the casing.

2. A well pipe puller as in claim 1 including a pair of well pipe-engaging wheels on said base; and wherein all said wheels are pneumatic.

3. Apparatus as in claim 2 wherein said legs comprise U-shaped channel members each facing the opening wheels 34. During positioning of the base on the casing, 20 and the edges of said frame extend into channels of said members.

> 4. A well pipe puller as in claim 2 wherein said means on the support comprises a member pivotally mounted on said support, bearings on said member with said wheel pivotally mounted in said bearings and means for pivoting said member and wheel about said pivot connection to move the wheel toward the wheel on the base.

5. A well pipe puller comprising a U-shaped base and 64. The pneumatic wheels may be deformed at en- 30 having a pair of opposed legs defining a supportreceiving opening facing to one side of the base, a semicylindrical clamp channel on the base adapted to extend partially around the outer circumference of a well casing, locking means for securing said clamp channel raised or lowered in the well by actuation of motor 42 35 to a well casing, a pair of well pipe-engaging wheels rotatably mounted on said base having adjacent circumferential portions defining a well-type receiving recess located above the clamp channel and facing toward said support-receiving opening, a support member separable from said base, a well pipe-engaging wheel on said support member, means slidably connecting the support member and the base legs whereby the support member can be positioned into the opening to a work position where the wheel on the support member is lo-45 cated adjacent said recess, locking means for securing the support member to the base in the work position, and means for moving the wheel on the support member toward said recess whereby a well pipe positioned in the recess is tightly confined between said three move the well pipe relative to the casing.

6. A well pipe puller as in claim 5, wherein said connecting means comprises a channel and rail connection between the base and support member at each leg.

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