

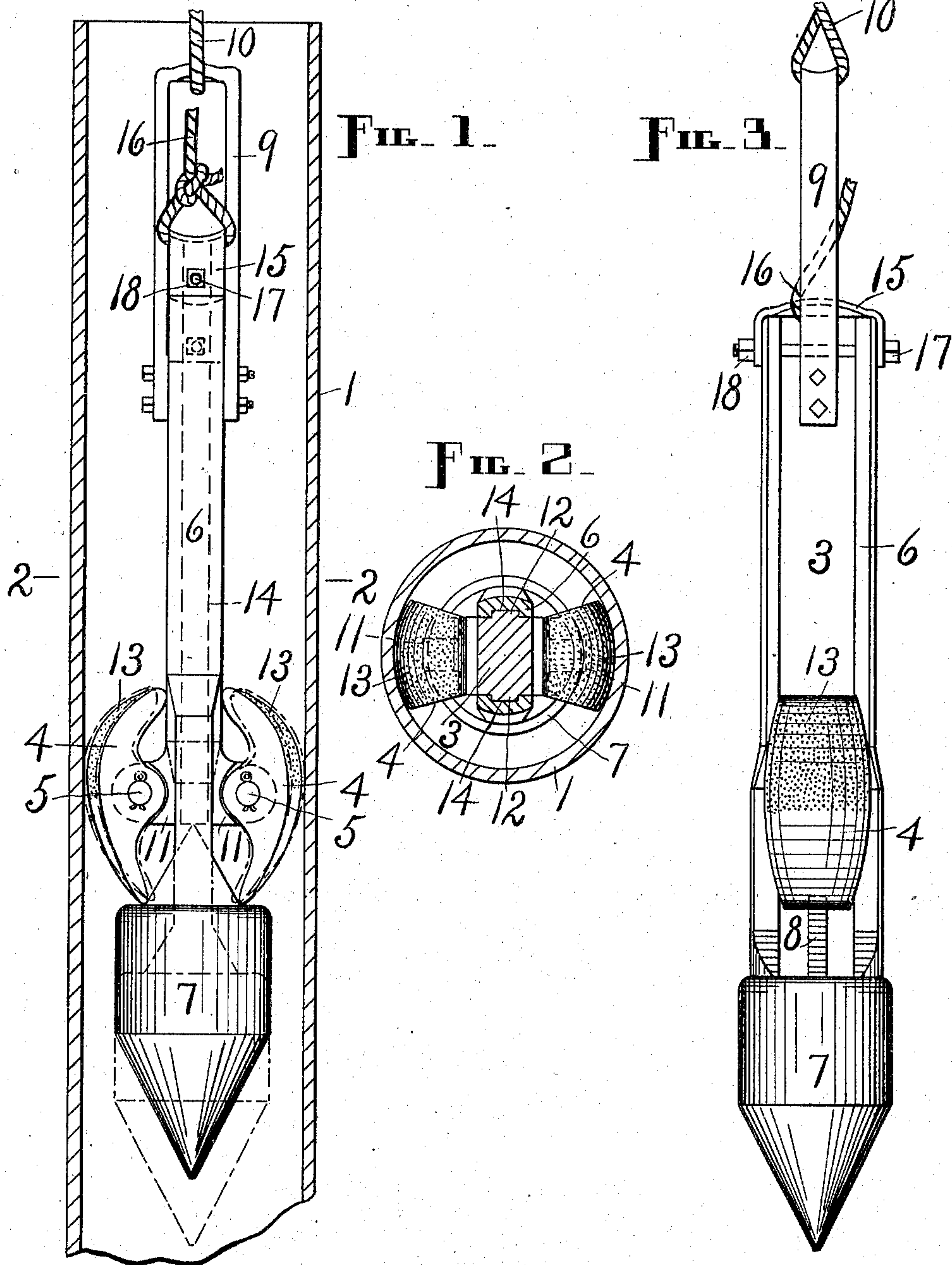
A. N. RUSSELL.

TUBE LIFTER.

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967,566.

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ALFRED N. RUSSELL, OF SPRINGFIELD, MASSACHUSETTS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALFRED N. RUSSELL, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Tube-Lifter, of which the following is a specification.

My invention relates to improvements in artesian-cylinder lifters or "fishing" devices or implements used in connection with driven wells for the purpose of grappling with or otherwise engaging and extracting working-barrels or other tubular members from the bores of wells anywhere below the surface, and consists more particularly of certain peculiar, mutually-reciprocal members, one of which is provided with lifting-jaws and the other with a combination guide and knock-off block, the guide feature being for the device as a whole and the knock-off feature for the lifting-jaws, all as hereinafter set forth.

The objects of my invention are, first, to produce a strong, durable, and easily manipulated tool or implement, the same being simple in construction as well as operation, with which to remove cylinders or working-barrels and other tubes from wells, even though the lost member or the member which it is desired to remove be at the very bottom of the well, in a practicable and efficient manner and without undue loss of time, and, second, to provide such a tool or implement with means for readily releasing it from any tubular member with which it may be engaged, so that full control of the implement is always afforded.

Other objects will appear in the course of the following description.

I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a lifter in which is embodied my invention in a practical form, such lifter being shown in its inactive condition, in full lines, and in its active condition, by dot-and-dash lines, in a tubular member; Fig. 2, a cross-section on lines 2—2, looking down, Fig. 1, and, Fig. 3, a side elevation of said lifter as viewed from a position at right-angles to that from which it is viewed in Fig. 1, and showing the parts standing as indicated by the aforesaid dot-and-dash lines.

Similar figures refer to similar parts throughout the several views.

In the first two views the upper portion of a working-barrel or cylinder is represented at 1.

The lifter consists of a block 3 provided with oppositely-disposed lifting-jaws 4—4 pivoted thereto at 5—5, and a frame 6 which rises from a guide 7, the latter being provided on top with a knock-off or separator wedge 8. The block 3 is provided at the top with a link 9 to which a rope 10 is fastened. At the base of the block 3 are oppositely-disposed lugs 11—11 which enter suitable recesses in the lifting-jaws 4 and to which said jaws are directly pivoted. The edges of the block 3 are provided with guide-ribs 12—12.

The lifting-jaws 4 are pivoted intermediate of their ends to the block 3 and so shaped and mounted on their pivots 5 that the outer or working faces of said jaws are adapted to engage at opposite points the walls on the inside of the cylinder 1, or any other tubular member the internal diameter of which is large enough to receive the device and not too large for said jaws to firmly engage its inner surface, when the jaws are free or clear of the wedge 8, and to engage such walls or inner surfaces with sufficient force to pull up or take with them said cylinder when the block 3 is drawn up. To this end the jaws 4 are so made that they contact with and grip the cylinder at points a little above the horizontal plane of the pivots 5, so that the elevation of the block 3 tends to rock said jaws above said plane outward, owing to the frictional engagement between the upper parts of the jaws and said cylinders; it follows, therefore, that the engagement at the aforesaid contacting and gripping points becomes stronger and firmer as the load increases, or, in other words, the greater the force required to raise the cylinder the more powerful is the frictional engagement between the jaws and the cylinder. The upper portions of the working surfaces or peripheries of the lifting-jaws are preferably abraded or roughened in some suitable manner, as indicated at 13, to insure a good grip on the inner surfaces of the tube.

The block 3 is fitted between the arms or side pieces of the frame 6, the guide ribs 12 being received into guideways 14—14 in said side pieces, and said block and frame are mutually reciprocal. At the top of the frame 6 is a strap 15 to which a rope 16 is attached, such strap in the present case being

fastened to said frame by means of a bolt 17 and a nut 18. The bolt 17 limits the upward movement of the block 3 or the downward movement of the frame 6, as is clearly apparent upon referring to Fig. 3. The guide 7, which is at the bottom of the arms or side pieces of the frame 6 and forms the base of said frame, is a solid and rather heavy member, cylindrical above and cone (inverted) shaped below. The office of the guide 7 is to direct the lifter into the tube, when the axis of said tube is not in line with the axis of the bore of the well, or when for any other reason the lifter requires centering relative to the tube which it is about to enter, the cone-shaped part of said guide then riding over the upper, open end of said tube into the same and the rest of the device following. The guide may be given any other shape suitable for the purpose.

The wedge 8 rises from the center of the guide 7, between the arms of the frame 6, and is adapted to enter between the lower ends of the lifting-jaws 4, when either said wedge is brought into operative relation with said jaws or the latter into operative relation with the wedge, and to separate such ends and thus throw the upper parts of the jaws inward.

In practice, the lifter is first lowered into the well, by the rope 16, a sufficient distance for said lifter to enter the cylinder 1, such distance being calculated from the known depth of the well and determined by the length of the rope paid out. When the lifter is suspended from the rope 16, the parts are disposed as shown in full lines in the first view, that is, the block 3 is down, or the frame 6 is up, whichever way the subject may be considered, with the wedge 8 between the lower terminals or tails of the lifting-jaws 4 so that said jaws are held out of gripping engagement with the cylinder. Now the rope 10, which was paid out with the rope 16, is drawn up, said rope 16 being relaxed, with the result that the frame 6 drops down on the block 3 or the latter rises in said frame to release the lifting-jaws 4 from the wedge 8, said jaws turn outward on the pivots 5 and grip the cylinder 1, and said cylinder follows the rope 16 with the lifter to the surface. In this manner the cylinder is extracted from the well. The parts at this time are disposed as shown by dot-and-dash lines in Fig. 1, and by full lines in Figs. 2 and 3. The lifting-jaws fly outwardly above their pivotal centers, when released by the wedge 8, because the heavier portions of said jaws are outside of and above such centers.

It is desirable to engage the cylinder with the lifter a third of the way, more or less, from the top of said cylinder, and if the

initial engagement is made too far down, as frequently occurs, the rope 16 is drawn up to knock off the lifting-jaws 4 and release the cylinder, the lifter is elevated by said rope to whatever extent may be necessary for proper engagement, and then the power is transferred to the rope 10, when the desired new engagement is made and the members are drawn out of the well.

In the event that the rope 10 breaks while a tube is being extracted, the lifter is caught and held by the rope 16, and the parts instantly shift to knock off and release the lifter from the tube, otherwise said lifter would be lost in the well and the difficulty of getting out said tube would be increased. In case of an accident of this kind, the lifter is drawn to the surface, supplied with a new rope 10, and let down again after the tube.

Various changes in shape, size, and minor details of construction may be made in this device without departing from the nature of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A tube lifter comprising mutually-reciprocal members respectively provided with pivotally-mounted self-acting or -operating lifting-jaws and means separable from such jaws to render them temporarily inactive or inoperative, each of such lifting-jaws being pivotally attached intermediate of its ends in an approximately vertical position to one of said members and having a preponderance of weight above and outside of its pivotal center.

2. A tube lifter comprising mutually-reciprocal members respectively provided with pivotally-mounted self-acting or -operating lifting-jaws and means to render such jaws temporarily inactive or inoperative, said lifting-jaws having longitudinally and transversely curved working faces or peripheries which flare or are farther from the pivotal centers of said jaws above the horizontal plane of such centers than on such plane.

3. A tube lifter consisting of a block provided with pivotally-mounted lifting-jaws adapted to frictionally engage and release a tubular member on the inside, and a guide with a frame rising from the top thereof and a wedge mounted on such top between the uprights of said frame and adapted to separate the tails of said jaws and so rock their upper portions inward, said block being inside of said uprights and said block and frame being in sliding relation to each other.

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Witnesses:

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