Jan. 16, 1923.

T. A. BAXLEY.

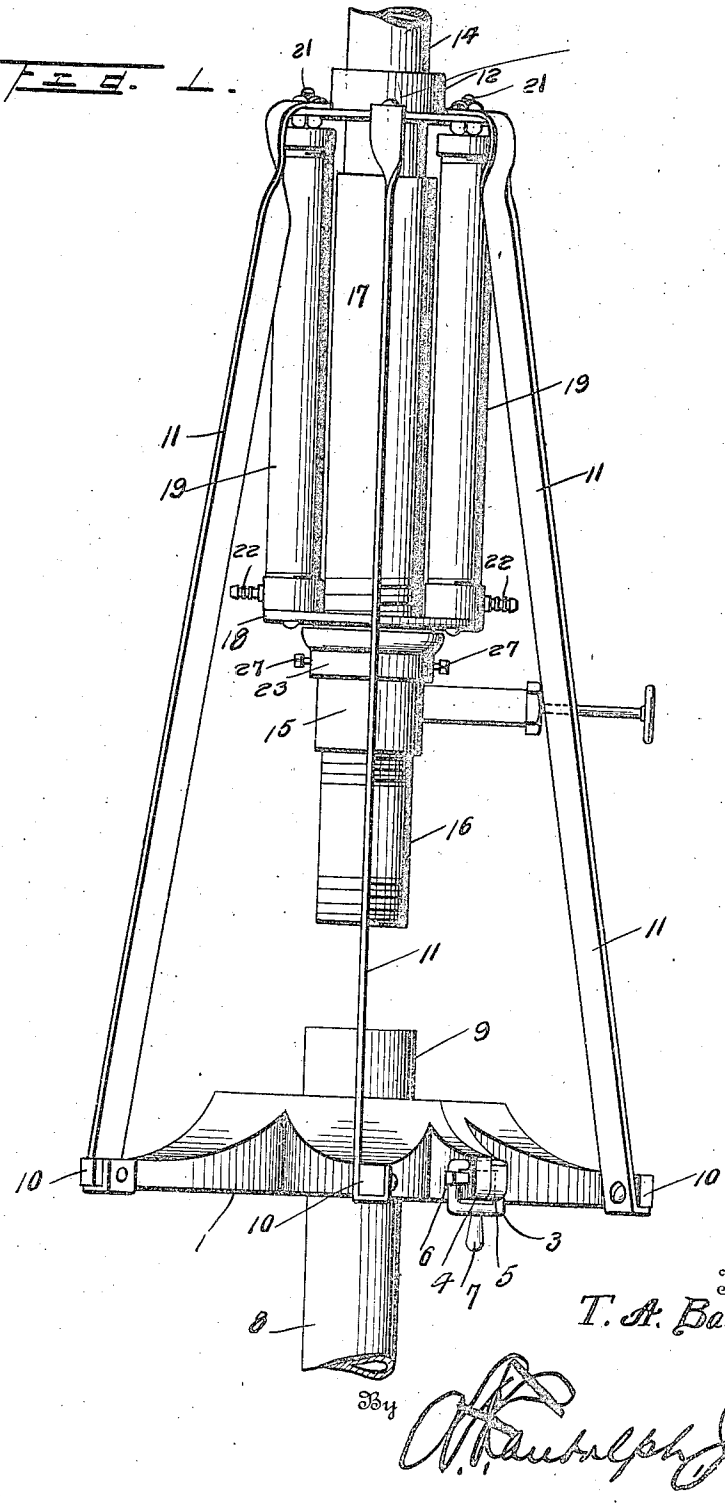
1,442,638.

GAS WELL CAPPER AND CASING PULLER.

FILED JUNE 1, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

FIG. 2.

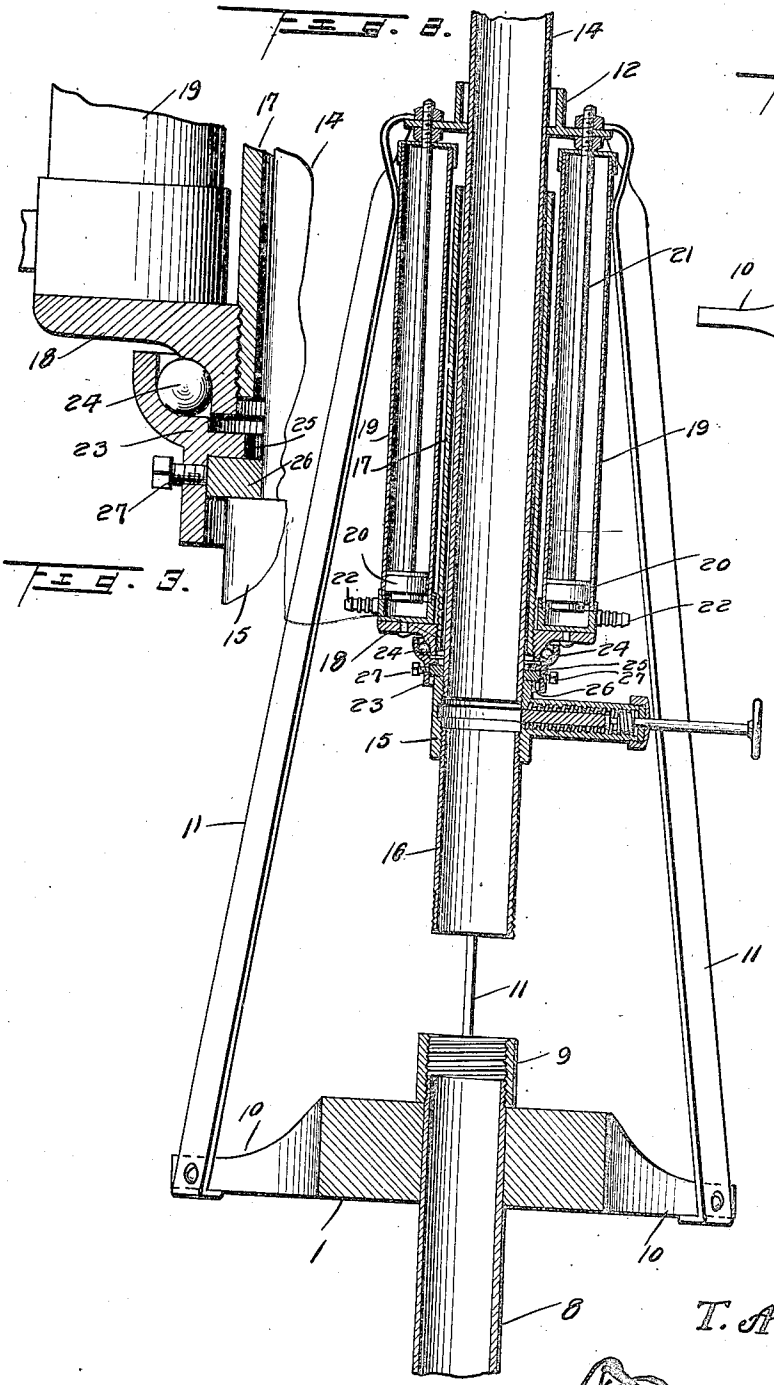
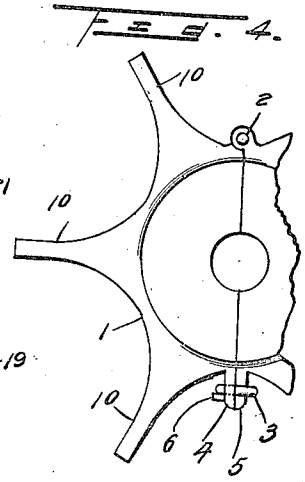


FIG. 3.

FIG. 4.



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3 SHEETS—SHEET 3.

Fig. 7.

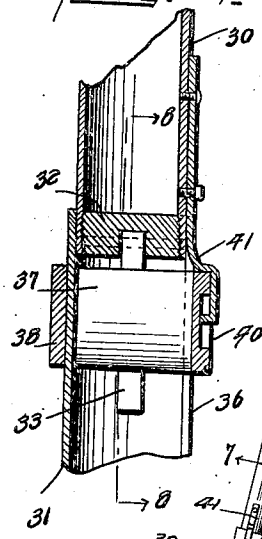


Fig. 5.

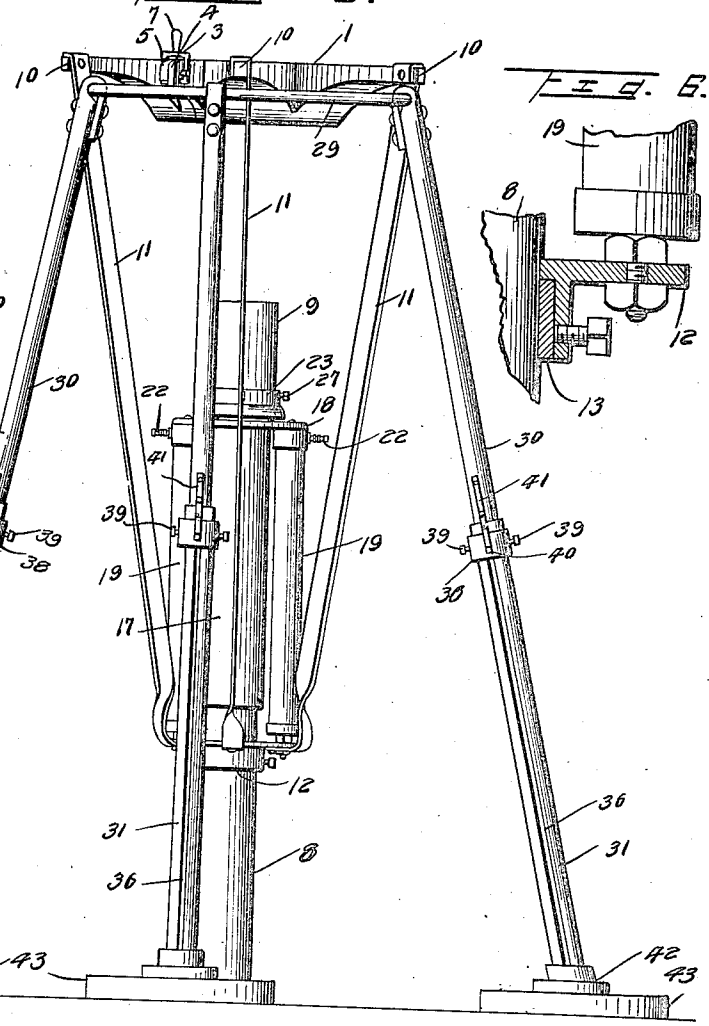


Fig. 6.

Fig. 8.

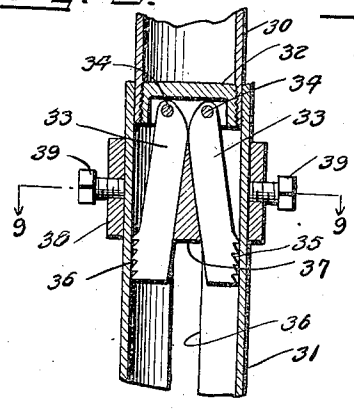
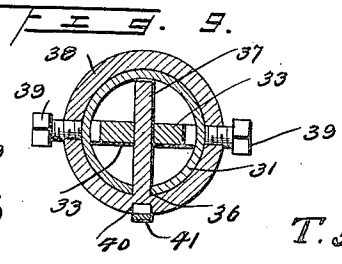


Fig. 9.



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Patented Jan. 16, 1923. 1,442,638

UNITED STATES PATENT OFFICE.

THOMAS A. BAXLEY, OF LAWTON, OKLAHOMA.

GAS-WELL CAPPER AND CASING PULLER.

Application filed June 1, 1921. Serial No. 474,085.

To all whom it may concern:

Be it known that I, THOMAS A. BAXLEY, a citizen of the United States, residing at Lawton, in the county of Comanche and State of Oklahoma, have invented certain new and useful Improvements in a Gas-Well Capper and Casing Puller; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the gas well industry the capping of the well, that is the placing of the valve in position at the upper end of the casing, is both hazardous and entails considerable time and requires the services of a gang of men besides the loss of gas. As a result the operation is expensive, not taking into account the risk of life and limb and the loss to property in event of a casualty.

The present invention provides an apparatus which may be used in capping the well and extracting the casing, either operation being effected with safety and in a comparatively short time and with the greatest ease and facility.

Other objects and advantages will be apparent and suggest themselves as the nature of the invention is understood.

While the drawings illustrate an embodiment of the invention it is to be understood that in adapting the same to meet different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings forming a part of the specification,

Figure 1 is an elevation of an apparatus embodying the invention illustrating the same adapted for capping a gas well.

Figure 2 is a view similar to Figure 1 partly in section.

Figure 3 is a sectional detail showing the ball-bearing parts on a larger scale.

Figure 4 is a detail view of a clamp whereby the apparatus is secured to the well casing, parts being broken away.

Figure 5 is an elevation showing the appliance adapted for extracting the well casing.

Figure 6 is a detail view of the connections between the guide and an operating cylinder, the parts being shown on a larger scale.

Figure 7 is an enlarged sectional detail on the line 7—7 of Figure 5.

Figure 8 is a section on the line 8—8 of Figure 7, and

Figure 9 is a horizontal section on the line 9—9 of Figure 8.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The appliance embodies a clamp 1 which is preferably of sectional formation, the sections being hingedly connected at 2 and connected by means of a link 3 pivoted to an offstanding lug 4 and engaging a corresponding lug 5 and retained in operative position by means of a pin 6 fitting in an opening formed in the lug 4. The link 3 is provided with a handle 7 for convenience of operation. When the link 3 is swung into upright position it clears the lug 5 so that the parts of the clamp 1 may be opened or closed as required. When the clamp 1 is fitted about the well casing 8 upward displacement is prevented by engaging a sleeve 9 threaded to the upper end of the casing, as indicated most clearly in Figures 1 and 2. The clamp 1 includes a plurality of radially disposed arms or projections 10 to which links 11 are attached.

A flanged guide ring 12 is connected to the clamp 1 by means of the links or straps 11. The guide ring 12 is adapted to receive shims 13—Figure 6—whereby a snug fit may be obtained between said guide ring and a section of pipe 14 cooperating therewith and having the valve 15 attached thereto. A short length of pipe 16 is coupled to the valve 15 and in the capping operation is adapted to make screw thread engagement with the sleeve 9. A tubular guide 17 is adapted to receive the pipe 14 and direct it and the attached valve 15 and pipe 16 when placing the valve 15 in position on the casing. A ring 18 is coupled to the lower end of the tubular guide 17 and supports opposed cylinders 19 which are fastened thereto in any substantial and convenient way. Pistons 20 in the cylinders 19 have their rods 21 connected to the guide ring 12. Motive medium, such as compressed air, steam or the like, is supplied to the lower ends of the cylinders 19 below the pistons 20 by means of suitable connections 22. A cup ring 23 is adapted to be clamped or secured in any manner to the

lower end of the pipe 14 adjacent the valve 15 and balls 24 are interposed between the cups thereof and a cone of the ring 18 to enable the pipe 14 and attached part to rotate with a minimum resistance when turning the valve 15 in the capping operation or the coupling of the same to the well casing. The cup ring 23 has an inner flange 25 which forms a shoulder for a filler 26 to abut against and which assists materially in the clamping of the cup ring 23 to the pipe 14 carrying the valve 15. Cap screws 27 threaded into the cup ring 23 provide means for securing said ring to the valve carrying pipe 14.

When it is required to cap or couple the valve to the upper end of the casing of a gas well the apparatus set forth herein is fitted to the upper end of the casing 8 and made secure by means of the clamp 1. The valve 15 is placed in position with the pipes 14 and 16 attached to the opposite coupling ends thereof. The cup ring 23 is secured to the valve carrying pipe 14 and is supported by means (not shown) in cooperative relation with the ring 18 so that the balls 24 are located in the race formed by the cup portion of the ring 23 and the cone of the ring 18. As is well known the gases issuing from the well exert an upward pressure on the valve 15 and adjunctive parts and great difficulty is experienced in lowering the valve against the pressure exerted by the uprushing gases. Moreover it is extremely difficult to align the valve and casing and at the same time advance the valve to effect the coupling thereof. The present invention provides means whereby the aligning of the valve is assured and maintained because the parts are so disposed that lateral movement is practically impossible. When motive medium is supplied to the cylinders 19 the cylinders and pistons 10 move apart and as the position of the pistons 20 is fixed they remain stationary because connected to the casing 8 by means of the ring 12, links 11 and clamp 1. As a result the cylinders 19 move downwardly and lower the valve and the pipes 14 and 16 coupled thereto. When the lower end of the pipe 16 reaches the coupling sleeve 9 which is in line therewith and upon turning the valve 15 the pipe 16 makes screw thread engagement with the sleeve 9 whereby the capping or coupling of the valve is effected. After the valve has been coupled to the casing the appliance may be removed by loosening the clamp 1. It will be understood that the apparatus greatly facilitates the capping operation and enables the same to be effected at a minimum cost and without endangering life or limb or entailing property loss.

When the apparatus is adapted for extracting or pulling a well casing it appears substantially as illustrated in Figure 5 and is inverted from the position indicated in Figures 1 and 2 because the operation is the reverse, the force expended being exerted in an upward direction to lift the casing. This necessitates the provision of a derrick or stand whereby to support the clamp 1 at the required elevation from the surface of the ground. The upper portion of the casing 8 extends through the tubular guide 17 and is clamped or otherwise secured to the cup ring 23, since the same moves upwardly whereas the ring 12 is lowermost and the casing 8 passes loosely therethrough.

The stand or derrick comprises a plurality of legs having an upward and inward inclination and connected at their upper ends by means of a ring 29 which is of such relative diameter as to receive and support the clamp 1 by means of its arms or projections 10 resting thereon. The legs comprising the derrick or stand have a telescoping arrangement to admit of their lengthening or shortening whereby to adapt the derrick or stand to support the clamp 1 at the required elevation. Each of the legs comprises an upper section 30 and a lower section 31. These sections are preferably tubular and may consist of lengths of pipe of suitable diameter to admit of one telescoping the other. A plug 32 is secured within the lower end of the section 30 and opposed dogs 33 are pivoted at their upper ends thereto as indicated at 34. The lower outer portions of the dogs 33 are toothed as indicated at 35 so as to engage the inner wall of the section 31 and prevent slipping. The lower section 31 is formed in a side with a longitudinal slot 36 in which operates a wedge 37 which extends across the section 31 and passes between the dogs 33. Relative upward movement of the wedge 37 forces the dogs 33 apart and causes their lower toothed ends 35 to bite into the inner wall of the section 31 at opposite points thereby holding the toothed sections 30 and 31 in adjusted position. A band 38 encircles the section 31 and carries the wedge 37 and is adapted to be secured in the required adjusted position by means of clamp screws 39 threaded into openings formed in the band at diametrically opposite points. Displacement of the band 38 is prevented by providing the same in a side with a longitudinal groove 40 which receives the bent end of a strap 41 attached to a side of the sections 30 in line with the slot 36 of the section 31 in which slot the strap 41 operates as indicated most clearly in Figure 7. The lower ends of the legs of the band or derrick are preferably provided with seats 42 which are adapted to rest upon bearing plates 43 whereby to prevent the leg from sinking into the ground when the apparatus is in operation for extracting or pulling the well casing.

When the apparatus is adjusted as indi-

cated in Figure 5 and motive medium is supplied to the cylinders 19 through the instrumentality of the connections 22 said cylinders move upwardly and elevate the cup ring 23 which is clamped or otherwise secured to the casing 8 thereby imparting an upward movement thereto and withdrawing the same from the well. Downward movement of the flange guide ring 12 is prevented since it is connected to the clamp 1 in the manner herein indicated and said clamp is supported by the derrick or stand by means of the ring 29 in the manner stated.

Having thus described the invention, what I claim is:—

1. An apparatus of the character specified comprising work engaging members, a cooperating guide in line with and between the work engaging members, and pressure exerting means between the said guide and one of the work engaging members.

2. An apparatus of the character specified comprising work engaging members, a cooperating guide in line with and between the work engaging members, and pressure exerting means between the said guide and one of the work engaging members, comprising a piston connected with one of said parts and a cylinder connected with the other part.

3. An apparatus of the character specified comprising work engaging members, means connecting said members, a work guide in line with and intermediate said members and a piston and cooperating cylinder, the one having connection with the work guide and the other with one of the said work engaging members.

4. An apparatus of the character specified comprising work engaging members, connecting means between said members, a work guide in line with and between said work engaging members, opposed pressure exerting means comprising pistons and cooperating cylinders having connection with the said work guide and one of the work engaging members, respectively, a member adapted to be secured to the work and movable therewith and anti-friction bearings between the work guide and the member adapted to be secured to the work.

5. An apparatus of the character specified comprising work engaging members, means connecting said members, a guide ring in line with and between the work engaging members, opposed pistons and cylinders having connection with the guide ring and one of the work engaging members, respectively and a work securing ring in cooperative relation with the said guide ring.

6. An apparatus of the character specified comprising work engaging members, a guide ring in line with and between said work engaging members, a tubular guide having connection with said guide ring, and pistons and cylinders at opposite sides of the tubular guide and having connection with the said guide ring and one of the work engaging members respectively.

7. An apparatus of the character specified comprising a clamp, a guide ring, connecting means between the guide ring and clamp, an intermediate guide ring in line with the clamp and first mentioned guide ring, and opposed pistons and cylinders having connection with the respective guide rings to effect a relative outward movement thereof.

8. An apparatus of the character specified comprising a clamp, a guide ring, connecting means between the guide ring and clamp, an intermediate guide ring in line with the clamp and first mentioned guide ring, a tubular guide carried by the intermediate ring, and cooperating pistons and cylinders at opposite sides of the tubular guide and having connection with the respective guide rings.

9. An apparatus of the character specified comprising a clamp, a guide ring, means connecting the guide ring and clamp, an intermediate ring, a tubular guide carried by the intermediate ring, cooperating pistons and cylinders at opposite sides of the tubular guide and having connection with the respective rings to effect relative opposite movement thereof, a ring adapted to be secured to the work, and anti-friction bearings between the last mentioned ring and the said intermediate ring.

10. An apparatus of the character specified comprising work engaging members, means connecting said members, a cooperating guide in line with and between said work engaging members, and pressure exerting means between the said guide and one of the work engaging members.

In testimony whereof I affix my signature in presence of a witness.

THOMAS A. BAXLEY.

Witness:

BENNETT S. JONES.