June 24, 1924. 1,499,225

G. KRELL

CASING ELEVATOR

Filed Nov. 16, 1922

Fig. 1.

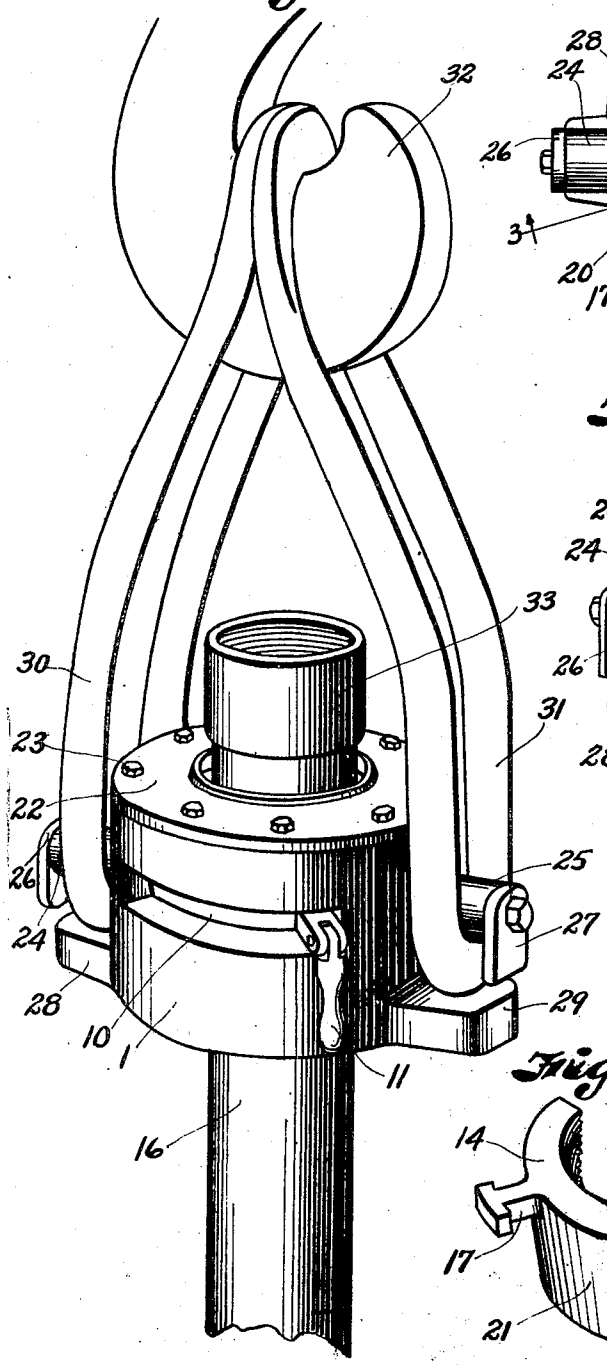


Fig. 2.

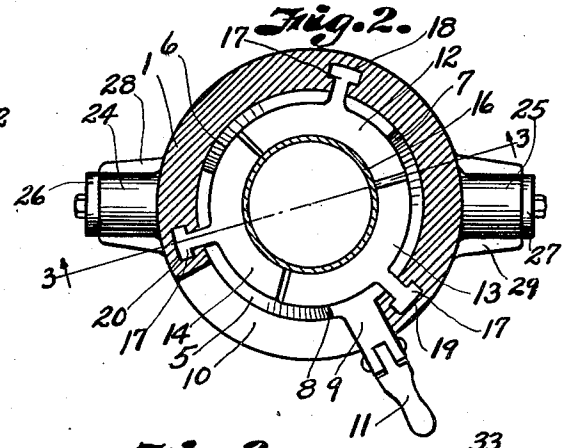


Fig. 3

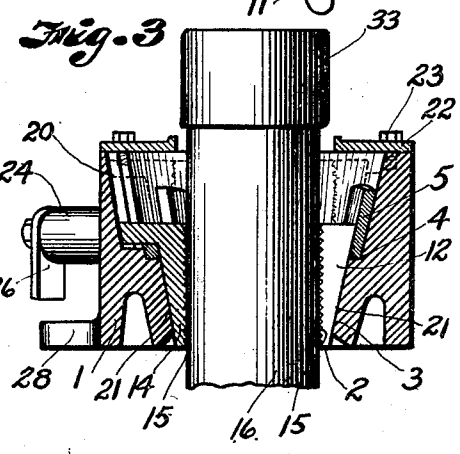


Fig. 4.

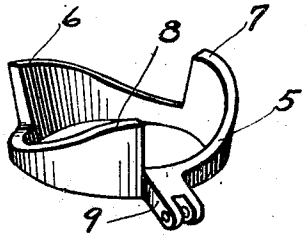


Fig. 5

INVENTOR
George Krell.
BY
ATTORNEY

Patented June 24, 1924. 1,499,225

UNITED STATES PATENT OFFICE.

GEORGE KRELL, OF KANSAS CITY, MISSOURI.

CASING ELEVATOR.

Application filed November 16, 1922. Serial No. 601,278.

To all whom it may concern:

Be it known that I, GEORGE KRELL, a citizen of Germany, residing at Kansas City, in the county of Jackson and State of Missouri, U. S. A., have invented certain new and useful Improvements in Casing Elevators; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to casing elevators, that is, to an elevator having a lowering or raising well casing. One of the objects of the invention is to provide a novel form of elevator having means for gripping the well casing in such a manner as to avoid liability of crushing the end or collar portion of the casing, and it is also the object of the invention to facilitate the application of the elevator to and removal from the casing.

It has generally been the practice to raise and lower oil well casings by ring shaped structures called elevators which surround the casing or pipe, and which are of such diameter that the offset internally threaded portions or collars at the ends of the pipe which make the union, rest upon the elevator so that they carry the entire weight. When such a method is employed, I find that the strain on the collar sometimes is so terrific due to the weight of the suspended casing that the collar becomes crushed and as a result the oil well casing is released from the elevator, resulting in the loss of the casing.

I have found that the casing can be releasably gripped below the collar, that is, the body portion of the casing section can be gripped by gripping jaws carried by the elevator, and that this manner of attaching the elevator to the casing affords a better means of suspending it, because the casing between the collars is not susceptible to crushing strains or adapted to be collapsed as easily as the collar is. I have, therefore, provided a novel means for gripping the oil well casing between the ends, and my invention consists in certain novel parts and arrangements of parts, all of which will be specifically referred to hereinafter, reference being had to the accompanying drawings, in which:

Fig. 1 is a perspective view of an elevator constructed in accordance with my invention showing a casing section held suspended thereby.

Fig. 2 is a horizontal cross sectional view through the elevator.

Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail perspective view of the jaw actuating member, and

Fig. 5 is a detail perspective view of one of the casing-engaging jaws.

The elevator is illustrated as having a ring-shaped casing 1 provided with a center bore 2, the wall of which is conical as at 3. The wall is provided with an offset or shouldered portion 4 on which rides a rotating jaw-actuating cam ring 5. The ring is shown as provided with three cams, 6, 7 and 8, and extending outwardly from the ring is a rigid arm 9 which projects through a segmental slot 10 in the casing 1. The arm 9 carries a pivoted lever 11, which is adapted to be controlled by the operator to move the ring about its axis on the shouldered portion 4. Within the ring 5 is a plurality of segmental wedge-shaped, casing-engaging jaws. In the present instance, I have shown three jaws designated 12, 13 and 14. The number of jaws correspond to the number of cams on the ring 5. Each jaw is wedge-shaped in longitudinal section and on the face of each jaw are teeth or serrations 15 which are adapted to impinge against or grip the casing 16. On each jaw is shown a radial outstanding T-head projection 17, there being one for each jaw, and the respective heads ride in the vertical T-shaped grooves 18, 19 and 20.

The floors of the grooves conform for angularity to the cone-shaped walls of the bore 2, therefore, when the T-heads 17 ride up in the grooves, the jaws will be moved regularly to increase the diameter of the opening between them. When they ride down in the grooves the jaws will be moved toward the center of the opening or into the casing gripping position. By reference to Fig. 3 it will be observed that the angles of the floors of the grooves correspond to the angles of the wall 3 so that the inclined walls 21 of the jaws will at all times bear against the wall 3 of the casing.

The under sides of the T-headed projection 17 rest upon the upper edges of the cams 6, 7 and 8, so that when the cam ring 5 is turned in one direction the jaws will be raised. When the cam ring is turned in the opposite direction, the jaws will gravitate slightly. The top of the ring 1 is provided with a covering plate 22 which may be fastened thereto by suitable fastening devices, as for example bolts 23. The ring or casing 1 is provided with oppositely disposed trunnions 24 and 25, having on their ends pivoted latches 26 and 27. Below the trunnions are oppositely disposed lugs 28 and 29. The trunnions are adapted to pass through links 30 and 31, which may be suspended from suitable supportings as for example the hook 32. When the parts are in position, the cam ring 5 can be rotated so as to raise the jaws to increase the diameter of the opening between them sufficiently to allow the elevator to be passed over the collar 33 of the casing section 16. When it is in approximately the same position shown in Figs. 1 and 3, the ring 5 will be rotating in the opposite direction so that the jaws 12, 13 and 14 will move into the casing-gripping position, assuming positions as illustrated in Figs. 1, 2 and 3. The casing may now be elevated or lowered. If lowered, the lugs 28 and 29 may rest upon the casing head to support the casing within the well while another section is being screwed into collar 33. When the new section is attached to collar 33, the latches will be swung in positions to permit the links 30 and 31 to be moved off the trunnions 24 and 25. When the new casing section is screwed into collar 33, another elevator will be applied to it and the links will support the trunnions of that elevator. Then when the casing is to be lowered, the previously applied elevator which is now serving as a spider to support the casing suspended in the well will be loosened so that the casing can pass down between its jaws until the topmost casing has been introduced into the well with its collar projecting above the casing-head, then the jaws of the elevator which is being supported by the casing-head can be caused to grip the casing to hold the casing suspended in the well while another section is being applied. This may continue indefinitely. When the casing is being pulled from the well a reverse operation will take place. It will be apparent that the elevator may be easily attached to the casing without liability of crushing or distorting the casing collar.

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

1. A casing elevator comprising a housing, a rotatable cam ring in the housing, vertically and radially movable jaws in the housing co-operating with the ring, and means for moving the ring to actuate the jaws.

2. A casing elevator comprising a housing, a rotatable ring in the housing having upstanding cams, casing-engaging jaws in the housing, means on the jaws for engagement with the cams when the ring is rotated for causing the jaws to rise, and means on the housing for imparting lateral movement to the jaws as they are raised.

3. A casing elevator comprising a housing having a conical bore, a shoulder in the bore providing a seat, a rotatable cam ring on the seat having upstanding cams, segmental jaws within the bore having headed portions engaging grooves in the housing, the jaws having portions resting upon the cams of the cam ring, and means for actuating the cam ring to impart movement to the jaws.

4. A casing elevator comprising a ring-shaped housing having a conical bore, jaws in the bore, wedge-shaped in cross section, a cam ring for imparting movement to the jaws longitudinally of the bore, and means on the jaws for guiding engagement with the casing.

5. A casing elevator comprising a ring having a cone-shaped bore, jaws in the bore and a cam ring carried by the casing for imparting movement to said jaws longitudinally of the bore.

In testimony whereof I affix my signature.

GEORGE KRELL.