

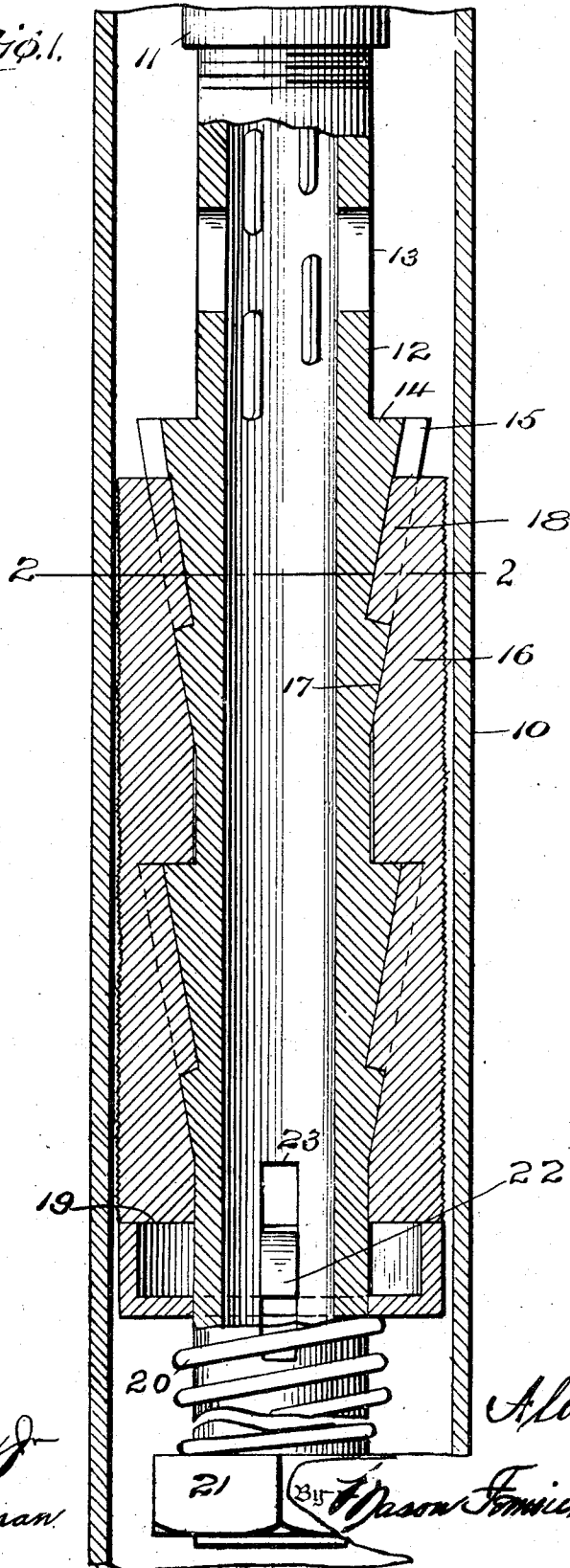
A. K. McKEE.
WELL TUBING LOCK.
APPLICATION FILED APR. 27, 1911.

1,028,759.

Patented June 4, 1912.

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses

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J. M. Kaufman

Inventors

Albert K. McKee

By Mason F. Lawrence

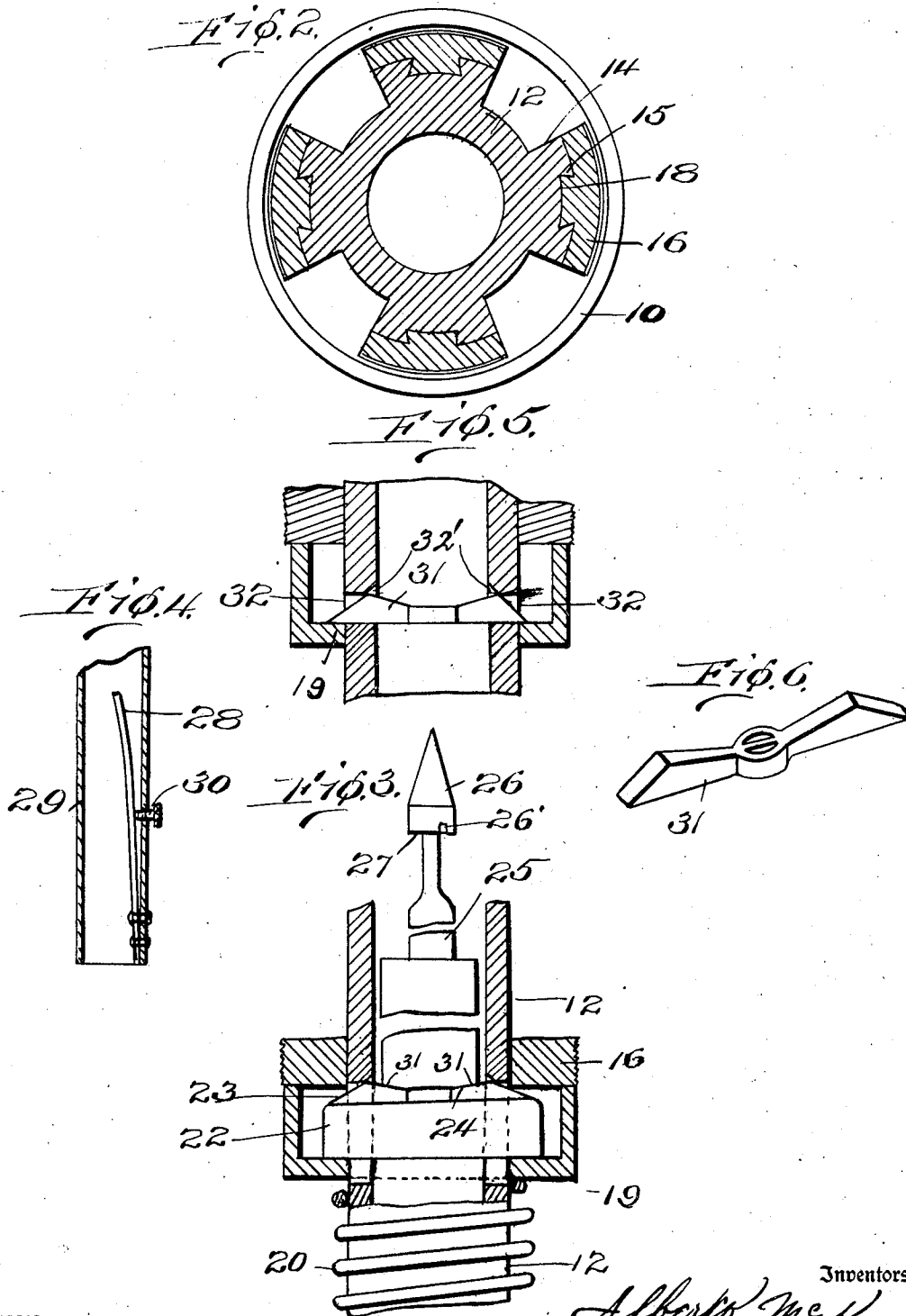
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UNITED STATES PATENT OFFICE.

ALBERT K. McKEE, OF COALINGA, CALIFORNIA, ASSIGNOR OF ONE-THIRD TO EUSTACE V. BRAY AND ONE-THIRD TO THOMAS COX, JR., BOTH OF COALINGA, CALIFORNIA.

WELL-TUBING LOCK.

1,028,759.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed April 27, 1911. Serial No. 623,695.

To all whom it may concern:

Be it known that I, ALBERT K. McKEE, a citizen of the United States, residing at Coalinga, in the county of Fresno and State of California, have invented certain new and useful Improvements in Well-Tubing Locks; 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.

This invention relates to locks for oil wells and has for its object to provide means secured to the lower end of a pump tubing to be locked to the inner wall of a well casing and adapted to carry the entire strain of the pump tubing above said lock.

Another object is to provide a lock capable of being secured to the well casing at any elevation and if so desired can be disengaged and raised or lowered to any other desired elevation.

Another object is to provide a lock having jaws which may be made of great length so as to distribute the weight over a great area on the inner wall of the well casing.

Further objects will be apparent from the following specification, appended claims and drawings thereof, in which:—

Figure 1 is a vertical section through a well casing showing my invention therein. Fig. 2 is a horizontal section as on the line 2—2 of Fig. 1. Fig. 3 is a vertical sectional view at right angles to Fig. 1. Fig. 4 is a vertical sectional view through a "mouse trap" as applied to my invention. Fig. 5 is a sectional view showing a modification of my invention as applied to the lock. Fig. 6 is a perspective view thereof.

Referring more specifically to the drawings there is shown a well casing 10 having a pump tubing 11 therein and secured to said pump tubing at the lower end thereof as by threads is a cylindrical shell 12, the upper end of which is provided with a plurality of perforations 13 for the admission of oil or the like to the pump. The shell 12 is provided with a plurality of upwardly flaring flanges 14 each of which is provided with a dove tail groove or slot 15 and the flanges are so arranged as to have one set below another, the grooves therein being in vertical alinement. Slips 16 are provided with bevel faces 17 which conform to the bevel of the flanges 14 and having dove

tail ribs 18 are adapted to slide on the flanges 14, the outer faces of said slips being serrated and adapted to bite into the walls of the casing 10 when said slips are raised obliquely with respect to the shell 12.

Arranged to slide vertically on the lower end of the shell 12 is a flanged washer 19 the flange thereof being adapted to bear against the lower ends of the slips 16. Arranged to bear against the under face of said washer is a spring 20 coiled about the shell 12 below the washer and said spring is in compression between the washer 19 and a retaining nut 21 screwed onto the lower end of said casing. This spring tends to raise the washer which in turn raises the slips 16, causing them to move obliquely and jam between the wall of the casing 10 and the flanges 14, thereby holding the shell 12 in locked position in respect to the casing 10 which in turn supports the pump tubing.

In order to hold the washer 19 depressed as for raising or lowering the lock into the casing 10 I provide a key 22 which is arranged to pass through the slots 23 diametrically opposite one another in the shell 12 and the ends of the key are arranged to bear on the upper face of the washer 19. In order to keep the key 22 depressed I provide a weight 24 which has a reduced shank 25 which is further reduced so as to form a head 26 which has a shoulder 27 arranged to receive a resilient member 28 carried by the "mouse trap" 29. The weight 24 is sufficient to overcome the tension of the spring 20 and it is seen that by resting the weight 24 on the key 22 the washer will move downwardly with respect to the shell 12 which in turn will permit the tubing and shell 12 to be raised and thereby will allow the slips 16 to fall into bearing relation with the washer 19, this permitting the lock to be raised or lowered, or in other words disengaged from the casing 10. It is not necessary to really have a "mouse trap" as shown in Fig. 4 but by having a weight working in conjunction with the "mouse trap" it can be appreciated that it is much easier to manage or control the lock than if the weight were secured to a long string of tubing which in turn would have to be handled. Or in other words by lowering the weight 24 into bearing relation with the key 22 the "mouse trap" 29 can be with-

drawn or removed from the tubing and the latter will remain in free condition with respect to the casing 10 and when the tubing and lock are moved to the desired position by lowering the "mouse trap" as shown in Fig. 4 the resilient member 28 will yield to permit the same falling low enough as to allow the upper end of the member 28 to engage under the shoulder 27 of the weight whereby the same may be raised from the lock which in turn releases the key 22 and permits the slips 16 to be engaged into the casing 10. In lowering the weight into the tube I remove the removable screw 30 from the "mouse trap" and engage the upper end of the resilient member 28 within the slot 26' formed in the head 26 of the weight and when the weight is lowered to its extreme movement the resilient member 28 falling low enough disengages from the slot 26' and releases the same permitting the "mouse trap" to be raised from the tubing.

As shown in Figs. 5 and 6 of the drawing there is a breakable key 31 which is intended to be made of cast iron or any other brittle metal and said member is adapted to pass through diametrically opposite slots 32 in the shell 12 and also bear upon the washer 19 and by the compression of the spring 20 the parts assume the position shown in Fig. 5 which permits the slips 16 to remain in their lower position enabling the lock to be lowered into the well casing 10. The openings 32 merge into notches 32' which permit the key 31 to be inserted more easily in position, and also to be properly adjusted after having been inserted. When the lock has been lowered to the desired depth a piece of tubing is lowered within the pump tubing and intended to break the member 31 which will drop to the bottom of the casing 10, then the washer will exert its energy on the slips 16 which will cause them to bite into the casing 10. By the application of the key 31 it is evident that after the lock has been positioned in the casing 10 it is impossible to lower the same without withdrawing the entire tubing and replacing another key but by the application of the key 31 in conjunction with the key 22 it is seen that the lock may be lowered initially to any depth and the several parts sprung into locking position, the remains of the key 31 falling to the bottom of the casing 10 will permit the key 22 to assume the position shown in Fig. 1 and when it is desired to change the relative position of the lock with the casing the application of the weight 24 will disengage the slips 16 from the casing and permit any movement of the lock desired.

The operation of the device is obvious from the foregoing but in wells where the tubing is supported from above or from locks which are above the pump therein

more or less trouble in the parts of the tubing which become affected by the reciprocation of the pump rod such as by wearing to a thin shell which eventually breaks and falls or becomes bent and it is quite difficult to remove such portions of rod from the well but in my invention the entire strain is carried by the lock and there are no depending portions therefrom which have any strain exerted thereon and when it is desired to remove the lock and tubing for renewal the entire tubing and lock may be drawn upwardly because of the slips 16 having a downward and inward movement.

I claim:—

1. A tubing lock for wells comprising a shell adapted to support a tube within a casing upwardly flaring flanges on said shell formed with grooves, slips slidable obliquely on said flanges, tongues on said slips engageable in the grooves in said flanges, a vertically slidable flanged washer carried by said shell, below the flanges thereon and a spring in compression below said washer and tending to raise the same, the flange of said washer bearing against the ends of said slips, and means to hold said spring so as to continuously press against said washer.
2. In a lock for tubing in wells, a casing, a tube within said casing, a shell secured to said inner tube, flaring projections on said shell, slips slidably carried by said projections, a flanged washer carried by said shell and in bearing relation with said slips, a nut carried by the end of said shell, a spring in compression between said nut and flanged washer and a removable key carried by said shell arranged to hold the washer depressed with respect to the shell.
3. In a tubing lock for wells, in combination with a shell having flared projections thereon, slips engageable with and slidable on said projections, serrated faces of said slips adapted to bite into the inner wall of a casing, a flanged washer slidable vertically on said shell and adapted to control the oblique movement of said slips, means to raise said washer with respect to the shell, a key carried by said shell and a weight adapted to depress said key against the means for raising the washer.
4. In a tubing lock, a shell, flaring flanges thereon, slips carried by said flanges, a flanged washer carried by said shell and adapted to control the movement of the slips with respect to the shell, means tending to raise said washer, and a plurality of keys carried by said shell adapted to hold the washer in its lowest position, one of said keys being capable of being broken and discharged from said shell when desired.
5. In a tubing lock, a shell, upwardly and outwardly movable slips carried thereby, a flanged washer slidable vertically on said shell and adapted to bear against said slips,

means below said washer tending to raise the same and a plurality of keys carried by said shell and adapted to bear against said washer in opposition to the means for raising the same, one of said keys being capable of being broken and dislodged from said shell when desired.

6. In a tubing lock, a shell formed with walls having slots therein, slips carried thereby, a flanged washer carried by said shell and adapted to control the movement of the slips, a key carried by said shell in said slots, a weight adapted to bear on said key and oppose the movement of said washer, a tubular shell, and a spring in said tubular shell adapted to engage with said weight in raising and lowering the same.

7. In a tubing lock, a shell, upwardly and outwardly movable slips carried thereby, a flanged washer slidable vertically on said shell and adapted to bear against said slips,

means below said washer tending to raise the same, a key carried by said shell and adapted to bear against said washer in opposition to the means for raising the washer, said key being capable of being broken and dislodged from said shell, a weight adapted to be lowered into said shell, said weight being formed with a recessed head, an auxiliary shell, a resilient member arranged in said auxiliary shell adapted to fit into the recess in said weight when the weight is lowered into said first mentioned shell, and means carried by said auxiliary shell for causing the spring to engage said recess when it is desired to raise the weight.

In testimony whereof I affix my signature in presence of two witnesses.

BERT K. McKEE.

Witnesses:

THOMAS COX, Jr.,
W. H. FRASER.