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1,618,368

T. S. DIETLE

CASING RIPPER

Filed Nov. 12, 1925

Fig. 1.

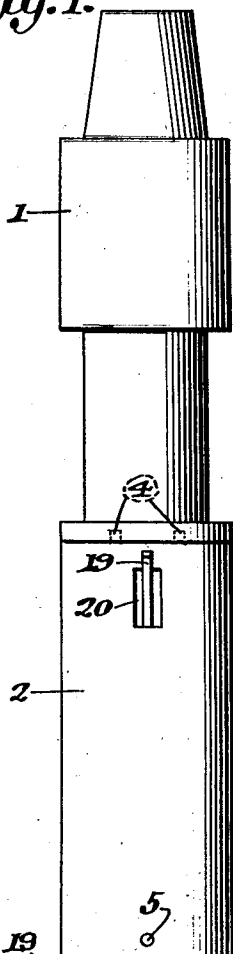


Fig. 2.

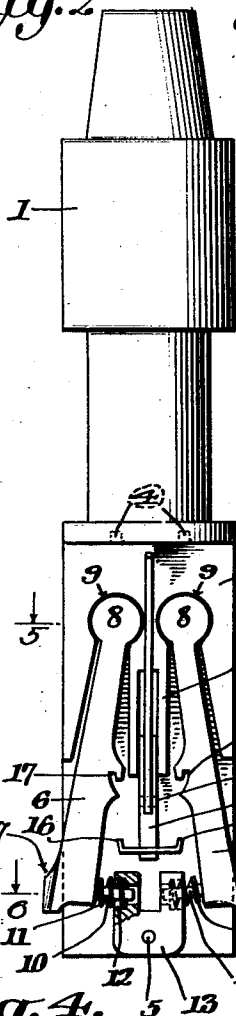


Fig. 3.

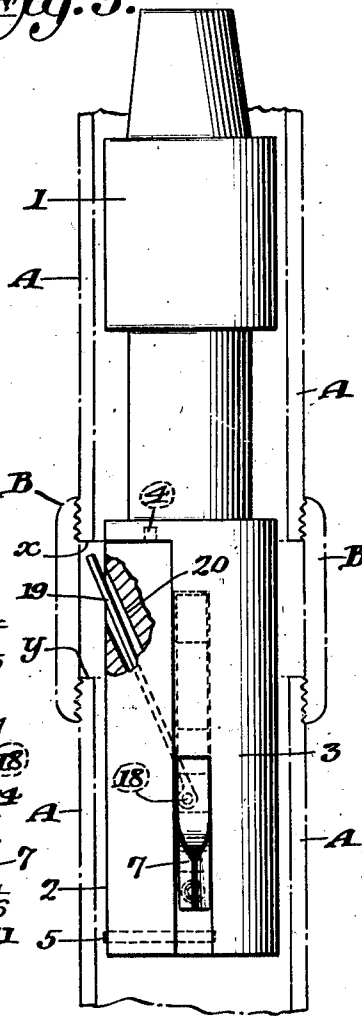
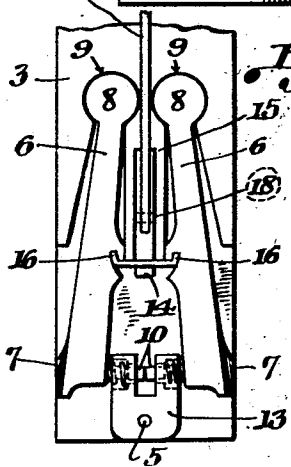


Fig. 4.

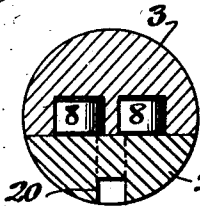


Fig. 5.

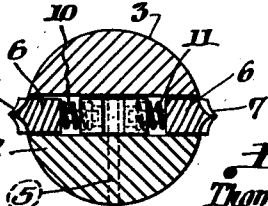


Fig. 6.

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CASING RIPPER.

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This invention relates to the mechanism for ripping or cutting the casing of an oil well or similar casing at a point adjacent the couplings of the sections of said casing so that the sections may be removed as desired. There are provided two knives which are normally retained in inoperative position within a cylindrical member so that the ripper may be lowered to any desired depth within the casing. Upon raising the ripper the knives are released from a detent and are forced outwardly by springs to a position in which they project beyond the contour of the cylindrical member. By driving the ripper with common tools and jars, the upper end of the casing section will be cut on opposite sides and a cut of only a few inches is necessary to weaken the casing sufficiently so that it may be removed from the coupling. At any time free upward movement of the ripper is permitted.

In the drawings, Fig. 1 is a perspective view of the casing ripper;

Fig. 2 is a side view with the removable part of the holding member removed to show the mounting of the knives which are illustrated as in operative position;

Fig. 3 is a side elevation at right angles to Fig. 1, with a part broken away and showing the tool within, a portion of a casing being indicated in dotted lines;

Fig. 4 is a view similar to Fig. 2, but showing the knives detained in their inner inoperative position;

Fig. 5 is a section on line 5—5 of Fig. 2; and

Fig. 6 is a section on line 6—6 of Fig. 2. The casing ripper may be provided with a portion 1 of an old or suitable character which permits attachment in the usual manner of means for raising and lowering the tool. The body portion of the ripper is composed of a removable part 2 which is fastened to portion 3 by means of pins 4 carried by the member 2 and fitting in corresponding sockets in the body member and by a pin or bolt 5 or similar fastening which passes through the member 2 into the member 3. The members 2 and 3 when joined are substantially cylindrical in form and of a size to fit easily within a casing A, two sections of which connected by a coupling B, are indicated in dotted lines in Fig. 3.

Two knives 6 having cutting edges 7 and rounded opposite ends 8 which fit in cutouts

9 in the member 3 are thus mounted for free swinging movement and are adapted to have the cutting edges 7 project outwardly through slots in the member 3 in the position to engage the casing A. At the lower ends and on the side opposite to the knife edges 7, each knife member has a pin 10 which is surrounded by a coil spring 11 which bears at one end against the knife 6 and at its other end against a socket 12 in a member 13 which is held in position by the same pin or bolt 5 which fastens the member 2 to the body member 3. These pins are of such length that when the knives are in inoperative position as shown in Fig. 4, the inner ends of the pin will just contact. The springs 11 tend to force the knives outwardly to the Fig. 2 position but they are normally restrained by the following mechanism.

A member 14 is slidably guided by a guide member 15 forming part of the member 3 and has at its lower ends a cross piece terminating in short upward ears 16. Each knife member 6 has a notch 17 on its inner side into which the ears 16 fit snugly when the parts are in the Fig. 4 position and thereby hold the knives against outward movement. Pivoted to the slide member 14 by a pivot 18 is a rod 19 which extends upwardly and outwardly through a passage cut through the member 2.

With the knives in inoperative position as shown in Fig. 4, the casing ripper is lowered into the casing to any desired point. When it has reached the lowest casing element it is desired to cut, the casing ripper is then pulled up slightly. Just after the parts pass the position shown in Fig. 3 on the upward movement of the casing ripper, the outer end of the rod 19 comes against the lower end of the casing sections A at the points *a*. Further upward movement of the casing ripper thereafter results in a downward movement of the rod 19 and a corresponding downward movement relative to the body of the ripper of the sliding member 14 which will move the ears 16 out of the notches 17 in the knives, thereby releasing the same and permitting them to be moved to the Fig. 2 position by the springs 11. When the parts have reached this position, the member 19 drops to such a point that its upper end no longer engages the end of the casing and therefore the casing ripper may be raised if desired. It is then raised until the knives

pass above the upper end of the other casing member A after which the casing ripper is raised and lowered rapidly a few times, the knives engaging the casing section at the point y, and cutting this section on opposite sides. As soon as this section has been sufficiently cut the casing ripper may be raised to the upper end of the next section and the operation repeated if desired. It is obvious that the knives themselves form no obstructions to the upward movement since their engagement with the sides of the casing at this time will merely cam the knives inwardly to an extent sufficient to permit such upward movement.

It is found that by cutting the casing on opposite sides for a short distance, probably but little more than the extent of the screw threads with which the casing engages the coupling B, the casing will be weakened sufficiently to spring in so that the sections may be removed. If the old type of single knife ripper is employed, it has been found necessary to cut three or four feet of casing to attain the same result. This action weakens the pipe to such an extent that a socket cannot be run over the joint left in the hole if it is desired to fish out the lower joint while with the casing ripper of the present invention such a procedure may be employed if desired. It is also to be noted that this casing ripper may be lowered to the extreme depth required and successive joints cut during the upward movement at the points desired without removing the tool for resetting.

It is obvious that many detailed changes may be made in the precise embodiment of the device without in any way departing from the spirit of the invention which is to be regarded as limited only by the scope of the appended claims.

I claim:

1. A ripper for casings formed of a plurality of sections connected by couplings, said ripper comprising a member adapted to be lowered in the casing, one side of said member being removable, cutouts in the body portion of said member, knives pivoted at their upper ends in said cutouts, the lower ends of which are movable to a position beyond the confines of said member when released, and

means constantly tending to move said knives outwardly.

2. A ripper for casings formed of a plurality of sections connected by couplings, said ripper comprising a member adapted to be lowered in the casing, one side of said member being removable, cutouts in the body portion of said member, knives pivoted at their upper ends in said cutouts, the lower ends of which are movable to a position beyond the confines of said member when released, means constantly tending to move said knives outwardly, and means lying between said knives and normally restraining them against such movement.

3. A ripper for casings formed of a plurality of sections connected by couplings, said ripper comprising a member adapted to be lowered in the casing, one side of said member being removable, cutouts in the body portion of said member, knives pivoted at their upper ends in said cutouts, the lower ends of which are movable to a position beyond the confines of said member when released, means constantly tending to move said knives outwardly, means normally restraining them against such movement, and means for releasing the restraining means by engagement with the end of a section of the casing upon upward movement of the member in the casing.

4. A ripper for casings formed of a plurality of sections connected by couplings, said ripper comprising a member adapted to be lowered in the casing and having slots in the sides thereof, knives pivoted within said member and having their cutting edges movable outward through the slots, means constantly tending to move the knives to operative position, means lying between said knives and restraining said movement, and means positively operated by the upward movement of the member within the casing to release said restraining means, the member being subsequently freely movable upward but operating to cut the upper end of a section of casing by downward movement.

In testimony whereof, I have hereunto subscribed my name.

THOMAS S. DIETLE.