Oct. 24, 1933. G. A. LOWREY ET AL 1,931,929

OUTSIDE CASING CUTTER

Filed Aug. 18, 1931

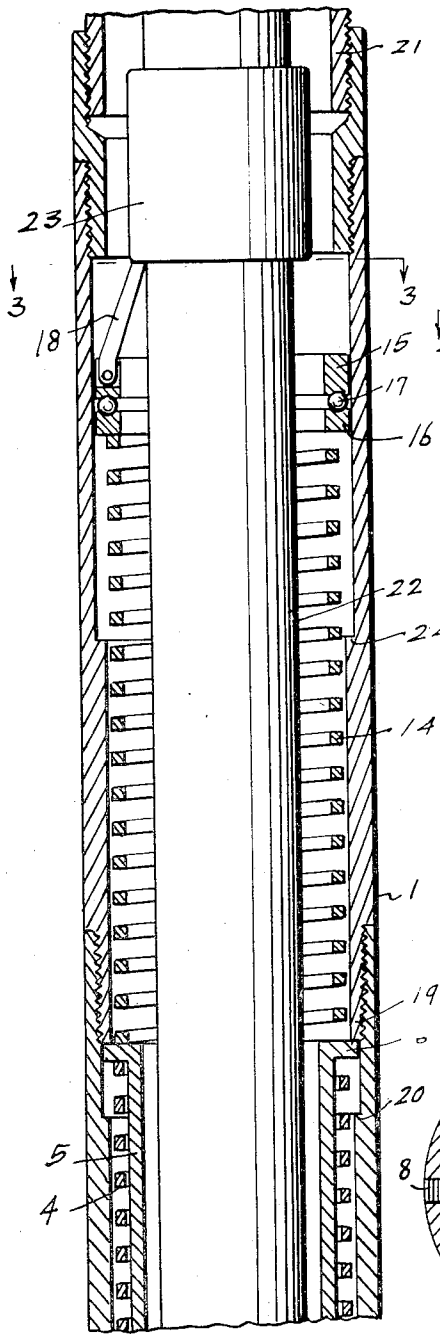


Fig. 1.

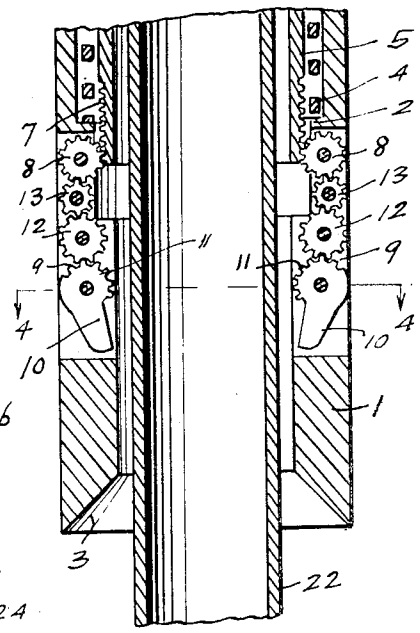


Fig. 2.

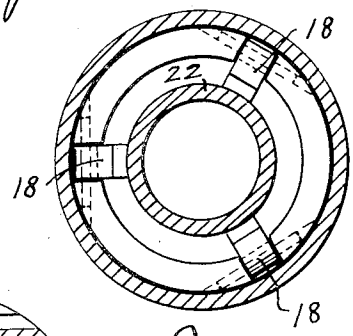


Fig. 3.

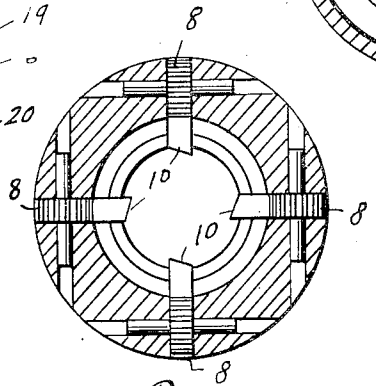


Fig. 4.

Inventors
George A. Lowrey
Walter F. Hall

By Hardway Tather
Attorneys

Patented Oct. 24, 1933 1,931,929

UNITED STATES PATENT OFFICE

1,931,929

OUTSIDE CASING CUTTER

George A. Lowrey, Pelly, and Walter F. Hall,
Goose Creek, Tex.

Application August 18, 1931. Serial No. 557,754

4 Claims. (Cl. 81—189)

This invention relates to an outside casing cutter.

An object of the invention is to provide a tool of the character described shaped to be lowered into a well over a casing or pipe therein and equipped with inwardly working cutters, cutter operating gearing and means engageable with the pipe to be cut whereby said gearing and cutters may be operated to hold the cutters in cutting relation with the pipe or casing to be cut.

Another object is to provide means whereby the cutters will be held yieldingly against the work.

Another object is to provide means for controlling and limiting the operation of springs employed.

With the above and other objects in view this invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is given in this specification and illustrated in the accompanying drawing, wherein:

Figure 1 shows a vertical sectional view of the upper end of the tool.

Figure 2 shows a vertical sectional view of the lower end thereof.

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 1, and

Figure 4 shows a cross sectional view taken on the line 4—4 of Figure 2.

Referring now more particularly to the drawing, wherein like numerals of reference designate similar parts in each of the figures the numeral 1 designates a tubular cutter body, the same as shown being formed of two sections. At its lower end the body is inwardly thickened forming the inside shoulder 2, said thickened lower end being flared to form a guide 3.

On the shoulder 2 there is a coil spring 4 which surrounds the tubular rack member 5, whose upper end has an external flange 6 which rests on said spring 4. The lower end of the rack member 4 has the external rack teeth 7 which are in mesh with the gears 8 mounted in vertical slots 9 in the wall of the body 1.

Pivoted in the lower ends of said slots 9 are the inwardly working cutters 10 whose pivoted ends have the gear teeth 11 thereon which are in mesh with the spur gears 12 also mounted in said slots 9. Between the gears 8, 12 and in mesh with them are the intermediate pinions 13.

Mounted on the flange 6 there is a strong coil spring 14 whose upper end supports the raceway rings 15, 16 between which are the anti-friction bearings 17 and pivoted on the ring 15 are the upstanding, inwardly inclined fingers 18.

The flange 6 is confined between the lower end 19 of the upper section of the body and the inside shoulder 20 of the body beneath and the range of movement of the rack member 5 is thereby limited.

In operation the tool may be lowered into a well by the tubular operating string 21 and the body 1 will be guided over the upper end of the pipe 22, to be cut by the guide 3.

When the tool is lowered to the desired location it may then be moved upwardly until the fingers 18 engage underneath a collar 23 of the pipe 22 and a further upward pull will place the spring 14 under compression and the rack member 5 will be forced downwardly operating through the trains of gearing described to force the cutters 10 inwardly into engagement with the pipe to be cut. The tool may now be rotated, through the string 21 until the cutters sever said pipe. During the rotation of the tool the ring 15 and fingers 18 will be held stationary by reason of the engagement of the fingers with the collar 23, and the cutters will be held firmly yet yieldingly against the pipe to be cut so that said pipe will be effectively severed and yet the cutters may yield so as not to be broken by taking too deep a cut.

The upward movement of the body 1 relative to the pipe being cut will be limited by the inside annular shoulder 24 in the body 1, coming into engagement with the race ring 16 above so that the cutters 10 will not be subjected to an excessive pressure inwardly against the pipe to be cut and the inward movement of the cutters 10 will be limited by the said annular shoulder 20 which limits the range of downward movement of the rack member 5.

When the cut has been completed, and the upward pull on the tool released, the spring 4 will elevate the rack member 5 and retract the cutters 10 from engagement with the pipe 22 and the tool may then be relocated or withdrawn.

The drawing and description disclose what is now considered to be a preferred form of the invention by way of illustration only while the broad principle of the invention will be defined by the appended claims.

What we claim is:

1. A cutting tool comprising a body shaped to be inserted over a casing in a well, inwardly movable cutters mounted in the body, cutter actuating means including a yieldable member, trains of gearing geared to the cutters and to said actu-

ating means, said cutter actuating means also including means engageable with the casing and effective to place said yieldable member under compression, upon an upward movement of the tool relative to the casing, whereby the cutters are held in cutting relation with the casing and a yeldable member arranged to retract said cutters when said compression is released.

2. A cutting tool including a cutter body shaped to be inserted into a well bore over a pipe in said bore to be cut, cutters pivoted in said body and movable inwardly into cutting relation with said tool, a rack member in the body, trains of gearing in operative connection with the rack member and geared to said cutters, a yieldable member associated with said rack member, means associated with said yieldable member and engagable with the pipe to be cut and effective to place said yieldable member under compression upon a longitudinal movement of the body relative to said pipe, whereby the cutters are forced into cutting relation with the pipe, and yieldable means acting against said rack member and normally tending to retract the cutters from cutting relation with the pipe.

3. A cutting tool including a cutter body shaped to be inserted into a well bore over a pipe in said bore to be cut, cutters pivoted in said body and movable inwardly into cutting relation with said pipe, a rack member in the body, trains of gearing in operative connection with the rack member and geared to said cutters, a yieldable member adapted to be placed under compression upon a longitudinal movement of the body relative to said pipe, whereby the cutters are forced into cutting relation with the pipe, means for limiting such longitudinal movement of the body relative to said pipe, and a yieldable member acting in opposition to the first mentioned yieldable member and normally tending to withdraw said cutters from such cutting relation.

4. An outside cutting tool including a tubular cutter body adapted to be inserted into a well bore over a pipe in said bore to be cut, cutters pivoted in said body and movable inwardly into cutting relation with the pipe, trains of gears mounted in said body and geared to said cutters, a tubular rack member shaped to surround the pipe to be cut and geared to said trains, a yieldable member in said cutter body supporting said rack member and normally holding said cutters retracted, means for limiting the movement of said rack member longitudinally of the body, a yieldable member supported on said rack member, means supported on said last mentioned yieldable member and engagable with the pipe to be cut and adapted to place said last mentioned yieldable member and engageable with the pipe to longitudinal movement of the body relative to said pipe whereby said rack member may be actuated to force said cutters into cutting relation with the pipe.

GEORGE A. LOWREY.
WALTER F. HALL.