Oct. 10, 1939. E. VENTRESCA 2,175,622

OUTSIDE PIPE CUTTER

Filed Aug. 30, 1937 2 Sheets-Sheet 1

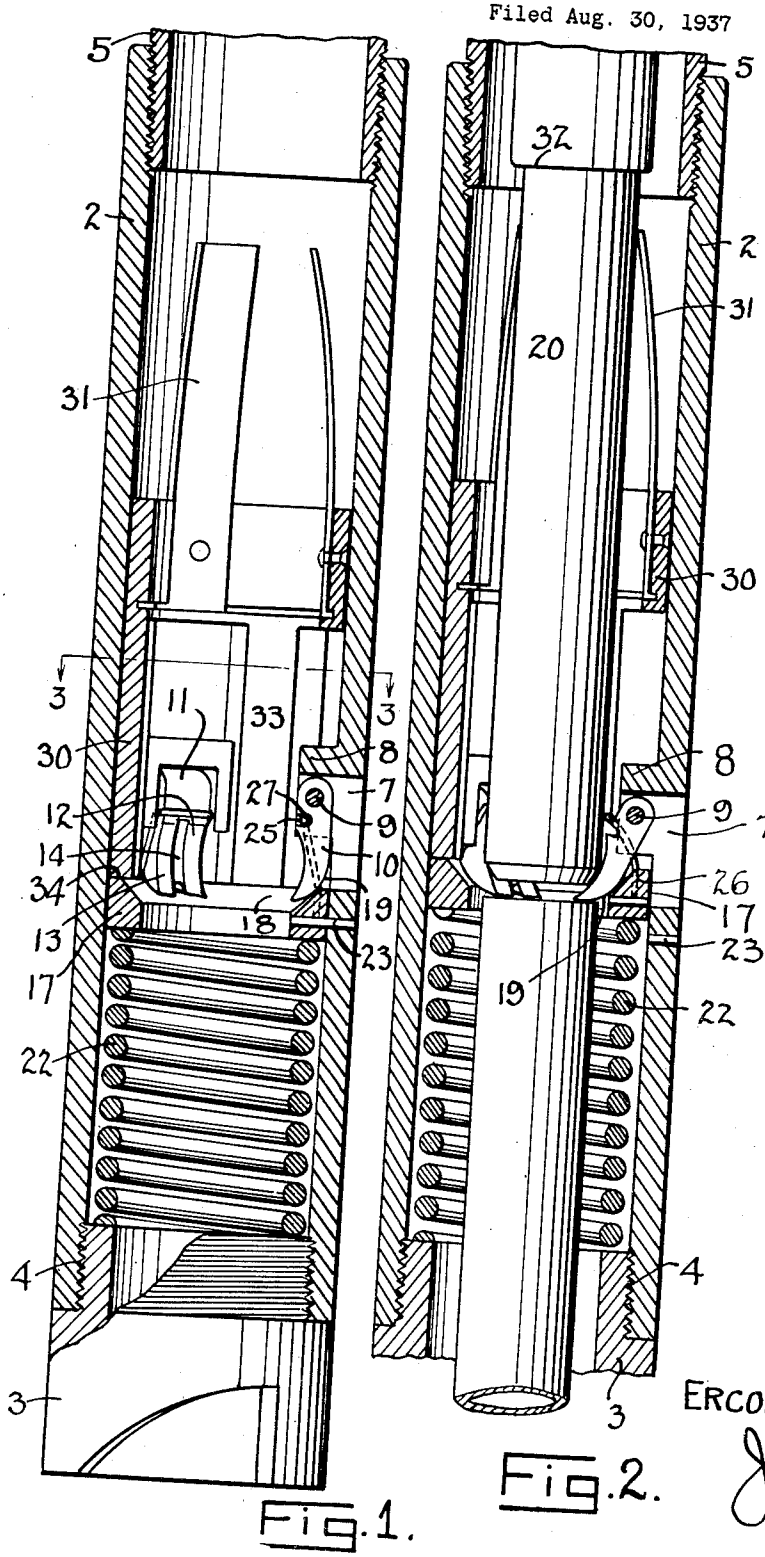


Fig. 1.

Fig. 2.

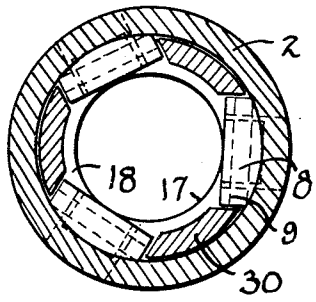


Fig. 3.

Inventor
ERCOLE VENTRESCA.
Jesse R. Stone
Lester B. Clark
Attorneys.

Oct. 10, 1939. E. VENTRESCA 2,175,622

OUTSIDE PIPE CUTTER

Filed Aug. 30, 1937 2 Sheets-Sheet 2

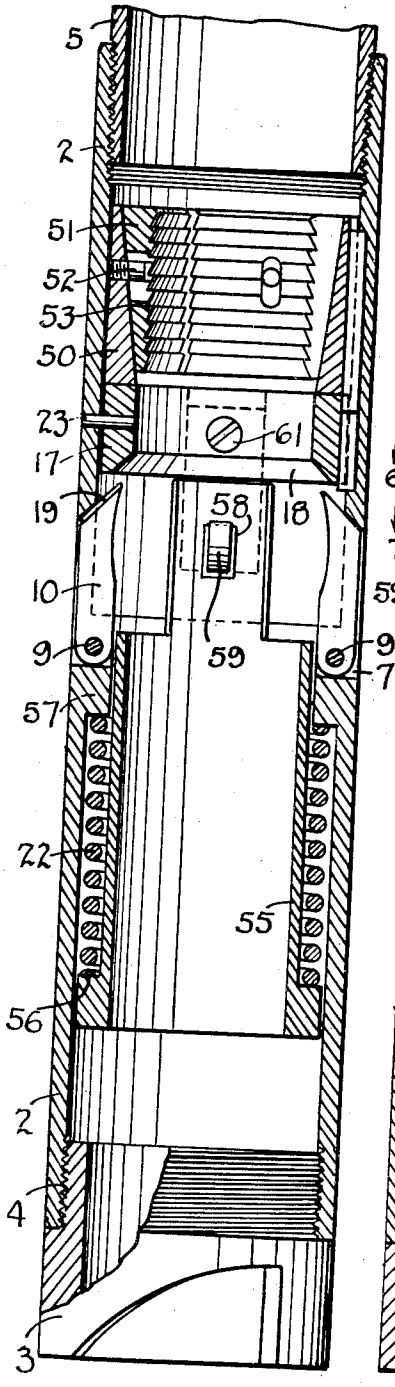


Fig. 4.

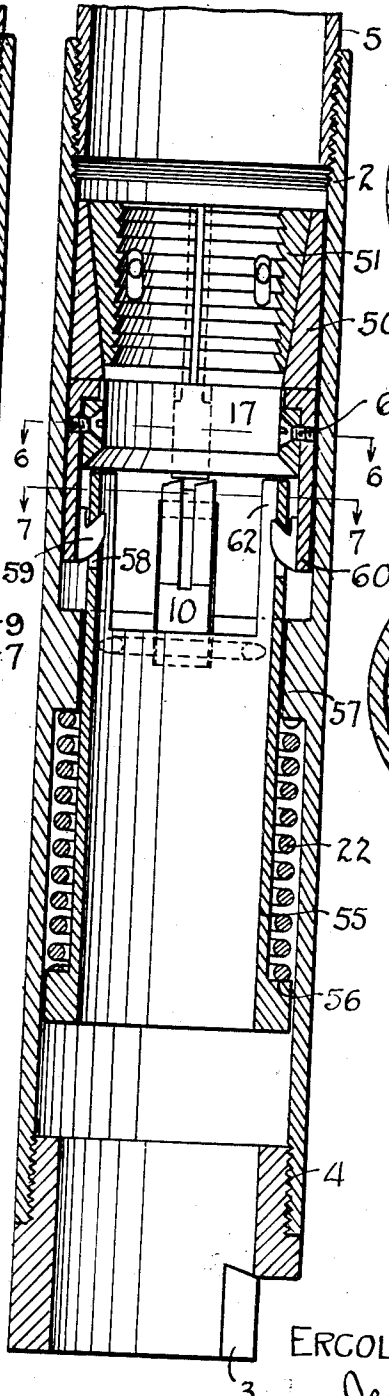


Fig. 5.

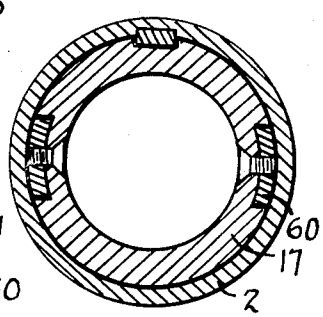


Fig. 6.

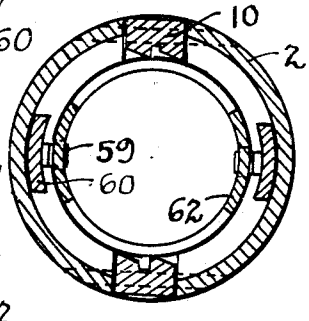


Fig. 7.

Inventor

ERCOLE VENTRESCA

Jesse R. Stone

Lester B. Clark

Patented Oct. 10, 1939

2,175,622

UNITED STATES PATENT OFFICE

2,175,622

OUTSIDE PIPE CUTTER

Ercole Ventresca, Houston, Tex.

Application August 30, 1937, Serial No. 161,536

11 Claims. (Cl. 164—0.6)

The invention relates to an outside pipe cutter which can be telescoped over a piece of pipe in a well bore and a cut executed to remove a section of such pipe.

It is one of the objects of the invention to provide a cutter which will be held inoperative while the tool is being lowered into the well bore and which provides an actuating mechanism which can thereafter be released so as to automatically advance the cutters.

Another object of the invention is to provide a wedge ring which may be released by engagement of the tool with the pipe to be cut and which will automatically advance the cutter upon rotation of the tool without further recourse to contact with the pipe.

Another object of the invention is to provide an outside pipe cutter wherein a driving mechanism is released by engagement with the pipe.

Still another object of the invention is to provide a cutter member for outside pipe cutters wherein a pair of cutter blades are arranged in spaced relation.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawings wherein:

Fig. 1 is a vertical sectional view of the tool as it is ready to be lowered into the well bore and showing the actuating mechanism held inoperative.

Fig. 2 is a vertical sectional view similar to Fig. 1 except that the tool has been telescoped over the pipe and the actuating mechanism released to perform the cut.

Fig. 3 is a section taken on the line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view of a slightly modified form of the invention showing gripping members for engaging the pipes to release the actuating mechanism.

Fig. 5 is a section taken transversely of the view shown in Fig. 4.

Figs. 6 and 7 are sections taken on the lines 6—6 and 7— 7, respectively, of Fig. 5.

In Fig. 1 a section of pipe 2 serves as a housing and is arranged to have a shoe 3 threaded at 4 to the lower end thereof so that the tool may be rotated as it is lowered into the well bore to remove accumulations of material from around the pipe which is to be cut. This housing is lowered into the well bore by means of a string of pipe 5 which serves as an operating string to raise, lower and rotate the tool.

The housing 2 is provided with a plurality of openings 7 which are here shown as three in number. Each of these openings is shielded by flange 8 and carries a cross-pin 9 upon which the cutter member 10 is pivoted. The cutter member is made up of a hub 11 and a pair of blades 12 and 13. These blades may be formed integral with the hub and are of identical construction, being arranged in parallel relationship with a small space 14 between the blades. Two blades are provided so that the cutting action may be speeded up and there will be a sufficient clearance between the blades to accommodate the cuttings. In event one blade becomes broken the cut may be performed by the other blade.

With a double blade of this sort a better cut may be made because two narrow cutters will fit against a small diameter pipe. With a single wide blade even a slight dulling of the blade results in a contact back of the point of the blade due to the curved surface of the pipe.

In order to actuate these blades a wedge ring 17 is slidably mounted within the housing 2 and has a beveled face 18 thereon which is arranged to abut against the curved surface 19 of the cutter members so as to cause them to pivot inwardly as seen in Fig. 2 to effect the cutting of the pipe 20. This wedge ring 17 is normally urged toward the cutter members by a coil spring 22 which is confined inside of the housing below the wedge ring and against the upper end of the shoe 3. When the tool is being lowered into position it is desirable to retain this actuating mechanism in an inoperative condition and one or more shear pins 23 may be passed through the housing and the wedge ring as seen in Fig. 1. This pin holds the wedge ring from contacting the cutter blades and driving them inwardly. In order to hold the cutter members from accidental inward movement until the cut is to be performed, a spring 25 is carried by the wedge ring 17 where it projects into a recess 26 in the ring and extends upwardly to be received in a pocket 27 in the cutter member. The tension of this spring serves to hold the cutter blades retracted so long as the wedge ring remains inoperative.

When the wedge ring moves upwardly, as seen in Fig. 2, to move the cutter members inwardly, however, the relative movement between the blade and the ring will cause the spring to move out of the pocket 27 so as not to interfere with the cutting operation. This position of the parts is seen in Fig. 2.

When the cutting tool arrives at the elevation where the cut is to be made it is necessary to release this wedge ring 17 and to accomplish this

release a sleeve **30** is slidably mounted within the housing and carries a plurality of inwardly extending fingers **31**. These fingers are arranged to engage beneath the lower end **32** of a coupling on the pipe **20** so that if the cutting tool is moved upwardly until these fingers engage a coupling then the sleeve **30** will be held by the coupling and the fingers **31** against further upward movement. This sleeve **30** has a plurality of splines or tongues **33** thereon which straddle the flanges **8** on the cutters and abut against the upper end of the wedge ring at **34**. Therefore, when the sleeve **30** is held immovable by contacting the coupling if the cutter tool is raised thereafter the pin or pins **23** will be sheared to release the wedge ring **17**. The tool must be lowered, however, so as to move the fingers **31** away from the coupling **32** so that the force of the spring **22** will move the wedge ring against the cutter. Of course the sleeve **30** will merely ride on top of the wedge ring after it has moved away from the coupling **32**. It is only necessary to then rotate the tool and the wedge ring will automatically fit the cutter to negotiate the cut, as seen in Fig. 2. No upward strain or pull need be taken on the pipe while the cut is being made and the cutter blades are the only parts of the tool which need engage the pipe during the cutting operation.

Figs. 4 to 7, inclusive, show a slightly modified form of the invention which is particularly adapted for use with smooth or flush joint pipe wherein engagement of the tool with a pipe coupling in order to release the actuating mechanism is unnecessary. In Fig. 4 the parts are quite similar to those previously described except the cutter blades **10** are pivoted on the cross pin **9** at the bottom so that the blades are upstanding and the wedge ring **17** is positioned in the housing above the cutter blades so that it will move downwardly against the cutters to pivot them inwardly during the cutting operation. The shear pin **23** is the same as previously described. In order to release the wedge ring **17** a short sleeve **50** is slidably mounted within the housing **2** and carries a set of slip jaws **51**. These jaws are limited in their sliding movement by the retainer pins **52** and they are arranged to slide on the inclined surface **53** on the inside of the sleeve **50** so that when these jaws move relative to the sleeve they will move inwardly and grip the pipe. This gripping action holds the sleeve **50** against movement so that if the housing **2** is thereafter moved upwardly the pin **23** will be sheared to release the wedge ring **17** for movement against the cutter blades.

In order that the spring **22**, which is positioned below the cutter blades **10**, may exert a pressure upon the wedge ring a tube **55** has been slidably mounted within the housing **2** and carries a shoulder **56** against which one end of the spring **22** abuts. The other end of the spring abuts against the shoulder **57** inside of the housing **2** so that the spring tends to normally move the tube **55** downwardly.

The upper end of the tube **55** is provided with a plurality of openings **58** which are arranged to receive the hooks **59** carried by the skirt **60**, which is held in engagement with the wedge ring **17** by means of the screws **61**, as best seen in Fig. 5. The parts are constructed in this manner so that they may be assembled in operative position. The upper end of the tube **55** is splined to provide the tongues **62**, as seen in Fig. 5. These tongues straddle the cutter members **10** and it is through the hooks **59** that the downward pull is exerted on the wedge ring to move it against the inclined surface **19** of the cutter members. In operation this form of the invention will be the same as described in connection with Fig. 1 except that the wedge ring can be released by an upward pull exerted at any time, regardless of whether the tool is closely adjacent the elevation of a coupling on the pipe or whether a flush joint smooth surface pipe is to be cut because the slips **51** will grip the pipe at any point when the tool is moved upwardly.

What is claimed is:

1. An outside pipe cutter comprising a housing, cutter members pivoted therein, a wedge ring to actuate said cutters, spring means to move said ring, means to hold said ring inoperative, and additional means directly engaging said ring and adapted to engage the pipe to be cut and to release said ring upon longitudinal movement of said housing.

2. An outside pipe cutter comprising a housing, cutter members pivoted therein, a wedge ring to actuate said cutters, spring means to move said ring, means to hold said ring inoperative, additional means directly engaging said ring and adapted to engage the pipe to be cut and to release said ring upon longitudinal movement of said housing, and still further means to hold said cutter inoperative when said ring is inoperative.

3. An outside pipe cutter comprising a housing, cutter blades therein, a wedge ring to engage said cutters, a spring to move said ring, a shear pin normally holding said ring in said housing against movement and said spring collapsed, and means to engage the pipe to be cut and to be forced against said ring upon upward movement of said housing to shear said pin and release said ring to engage said cutters.

4. An outside pipe cutter comprising a housing, cutter blades therein, a wedge ring to engage said cutters, a spring to move said ring, a shear pin normally holding said ring in said housing against movement and said spring collapsed, and means to engage the pipe to be cut and to be forced against said ring upon upward movement of said housing to shear said pin and release said ring so that upon subsequent lowering of the housing the ring will be forced under the influence of said spring to engage said cutters, said last means including a sleeve having spring fingers thereon.

5. An outside pipe cutter including cutter blades, a wedge ring to actuate said blades, spring means normally urging said ring upwardly toward said cutter blades, a shear pin restraining said ring, means to engage a pipe coupling and to shear said pin on upward movement of said pipe cutter, said spring acting to move said ring against said cutter blades after said pipe cutter is lowered following the shearing of said pin.

6. A pipe cutter including a housing, cutter members pivoted therein, a wedge ring to actuate said members, means normally holding said ring spaced from said cutter members, a sleeve to abut said ring, pipe engaging members on said sleeve whereby said holding means may be sheared, and spring means to thereafter move said ring to actuate said cutters.

7. An outside pipe cutter comprising cutter members, a wedge ring to actuate said members, a skirt on said ring, a tube depending from said skirt, and spring means urging said tube to move said ring.

8. An outside pipe cutter comprising cutter

members, a wedge ring to actuate said members, a skirt on said ring, a tube depending from said skirt, and spring means urging said tube to move said ring, said tube straddling said cutters.

9. An outside pipe cutter comprising cutter members, a wedge ring to actuate said members, a skirt on said ring, a tube depending from said skirt, and spring means urging said tube to move said ring, said skirt having hooks to receive said tube.

10. A pipe cutter including, a shell arranged to encircle a pipe to be cut, an internal abutment at the lower end of the shell, a sleeve slidable in the shell and having openings, a plurality of cutters pivoted in the shell and movable through the openings of the sleeve into the bore of said sleeve, elements on the upper end of the sleeve for engaging a joint of the pipe to be cut to arrest upward movement of said sleeve, means within the shell movable to engage the swinging ends of said cutters to engage them with the pipe to be cut, and a coiled spring disposed between said abutment and said means and under sufficient compression to move said means upwardly and apply said cutters to the pipe with sufficient force to cut said pipe when the shell is rotated.

11. A pipe cutter including, a shell arranged to encircle a pipe to be cut, an internal abutment at the lower end of the shell, a sleeve slidable in the shell and having openings, a plurality of cutters pivoted in the shell and movable through the openings of the sleeve into the bore of said sleeve, elements on the upper end of the sleeve for engaging the joint of the pipe to be cut to arrest upward movement of said sleeve, means within the shell movable to engage the swinging ends of said cutters to engage them with the pipe to be cut, a coil spring disposed between the abutment and said means and below the cutters and under sufficient compression to move said means upwardly and apply said cutters to the pipe with sufficient force to cut said pipe when the shell is rotated.

ERCOLE VENTRESCA.