Jan. 5, 1932. E. VENTRESCA 1,839,622

OUTSIDE PIPE CUTTER

Filed April 4, 1930

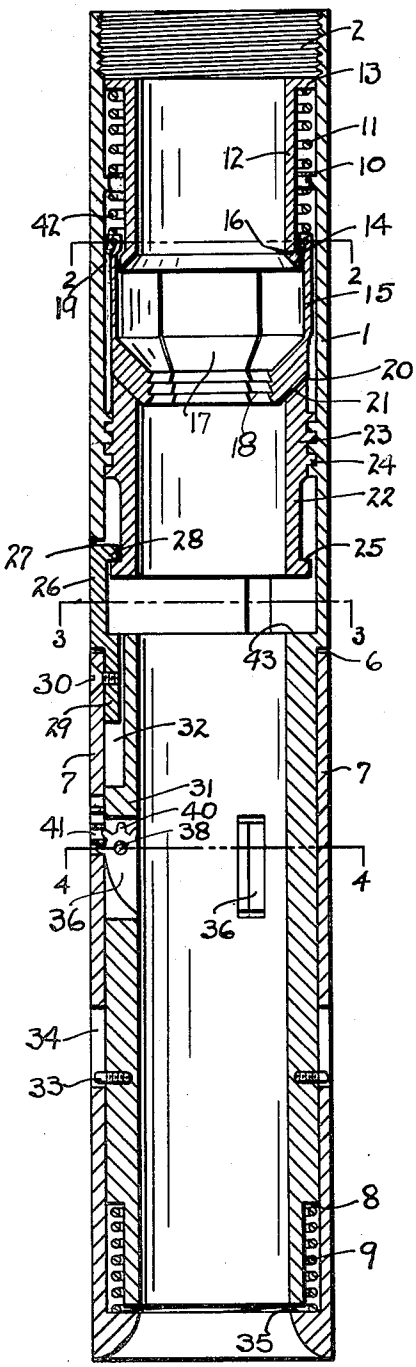


Fig 1

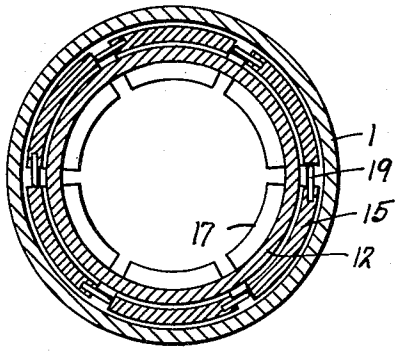


Fig 2

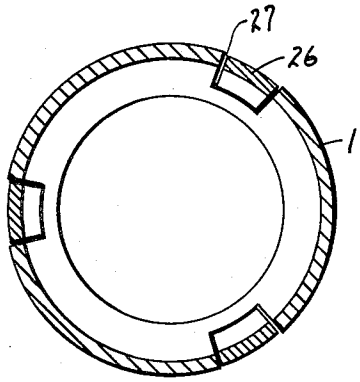


Fig 3

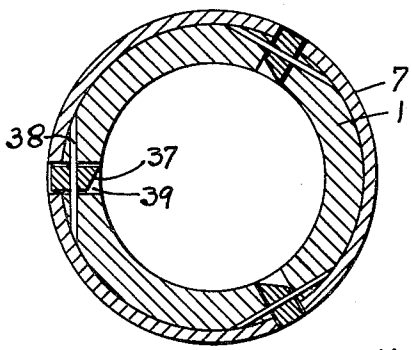


Fig 4

ERCOLE VENTRESCA
INVENTOR.

BY Jesse R. Stone
Lester B Clark

ATTORNEY.

Patented Jan. 5, 1932 1,839,622

UNITED STATES PATENT OFFICE

ERCOLE VENTRESCA, OF HOUSTON, TEXAS

OUTSIDE PIPE CUTTER

Application filed April 4, 1930. Serial No. 441,474.

My invention relates to pipe cutters, and particularly pipe cutters adapted to telescope over pipe in wells and sever the same in sections so that the pipe may be withdrawn from the well and thus salvaged.

In well drilling operations it frequently becomes necessary to remove pipe from the well. Where casing has been set and it is found that the well is not sufficiently productive the casing is usually found to be stuck in the well so that it can not be pulled and thus removed. In order to release it it is necessary to wash down over the casing and cut it off in sections and remove it. Also pipe which is junked in the well due to accident may be removed in sections by telescoping over the outside of the pipe and cutting it off and removing it in short lengths.

It is an object of my device to provide a tool which is adapted to engage over the outer side of the pipe and to operate to cut the pipe at any desired level.

It is a further object to provide a device of this character which will grip the pipe to be removed and hold the same securely during the cutting operation but which is also adapted to release the pipe when desired either after the pipe has been severed or in case for some reason it can not be removed after it has been severed.

I desire to provide a pipe cutter of this character which is of simple construction and positive in its action so that it will not fail to function in operation.

With reference to the drawings herewith, Fig. 1 is a central longitudinal section through a pipe cutting device constructed in accordance with my invention.

Figs. 2, 3 and 4 are transverse sections on the planes 2—2, 3—3 and 4—4 respectively.

My device is a tubular structure adapted to be connected to the lower end of an operating pipe such as the drill stem. It includes an outer housing 1 whose upper end is threaded at 2 for engagement with the operating pipe. The housing 1 is of the full diameter of the tool to a point indicated at 6, at which point it is reduced in diameter and adapted to telescope within a sleeve or shoe 7. The wall of the tool is increased in thickness at this point and an outer recess is formed at 8 at the lower end to provide space for a spiral spring 9.

The upper portion of the housing 1 is formed with an inwardly extending flange 10 upon which is adapted to rest a spiral spring 11, which supports a holding sleeve 12. Said sleeve 12 has an upper flange 13 against which the spring bears and its lower end is extended below the flange 10 and has an outwardly inclined shoulder 14 thereon to engage with the upper end of a clamping sleeve 15.

The clamping sleeve 15 is formed with an inner shoulder 16 at its upper end to engage on the shoulder 14 of the holding sleeve. In this manner it is suspended within the housing. Said sleeve 15 is divided into a plurality of jaws and with reference to Fig. 2 it will be seen that there are six jaws 17, the lower ends of which are extended inwardly and formed with teeth 18 to engage the pipe which is to be cut. The jaws 17 constituting the sleeve 15 are spaced apart adjacent the upper ends by small pins or dowels 19. These dowels are fitted within a recess in the side of one jaw and project laterally into contact with the side of the adjacent jaw, thus forming a sort of bearing, spacing the jaws apart but allowing them to swing freely so as to properly engage the pipe. The lower external side of each jaw is tapered to engage with a tapered seat 21, upon an adjusting collar 22.

The adjusting collar 22 fits within the housing and is threaded at 23 to engage with similar threads 24 upon the inner portion of the housing at this point. These threads are coarse square-faced threads adapted to unscrew readily. The lower end of the adjusting sleeve has an outwardly extending flange providing a shoulder 25 upon which are adapted to be supported a plurality of links 26.

I have shown three of these links 26, as will be noted from Fig. 3. The outer wall of the housing is provided with openings at 27 within which the upper portion of the link may fit. Each link has an inwardly extending finger 28 engaging upon the shoulder 25 of the adjusting sleeve. The lower end of

each link is extended inwardly and downwardly to fit within the shoe 7, as will be seen from Fig. 1. This lower end 29 is secured to the shoe by means of a set screw 30 or other similar means. It will also be noted from Fig. 1 that the thickened wall 31 of the housing is grooved or recessed at 32 so as to allow sliding movement of the links therein.

The shoe 7 telescopes over the reduced outer diameter of the housing as will be understood from the drawings. It is slidable relative to the housing and this sliding movement is limited by pins 33 engaging within longitudinal slots 34 in the shoe. The lower end of the shoe is extended inwardly to form a shoulder 35 which limits the downward movement of the housing relative thereto. The spring 9 bears upon the shoulder 35 and tends to force the shoe downwardly relative to the housing.

At a level spaced upwardly from the lower end of the housing I have mounted a plurality of cutters 36. I have shown three of these cutters although a different number may be employed if desired. Each cutter comprises a blade, the inner side of which is beveled at 37 to extend in the direction of rotation of the housing. Each cutter is mounted upon a transverse pin 38 extending across the slot 39 in the housing provided for that purpose. The upper end of the cutter is formed with gear teeth 40, said teeth being formed on the arc of a circle with the pin 38 as a center. These teeth are adapted to engage within a series of openings 41 in the shoe, said openings forming a sort of rack to engage the teeth of the cutter and by relative movement of the shoe to rotate the cutter on the pin 38 as an axis.

In operating my device the parts will be assembled as shown in Fig. 1. It will be seen that the clamping jaws 17 will be supported upon the lower end of the holding sleeve 12 and said holding sleeve will be resiliently supported by means of the spring 11. I also provide a spring 42 between the flange 10 and the upper ends of the jaws 17 tending to hold the jaws downwardly against the upper end of the adjusting sleeve 22. As the device is inserted downwardly over the pipe which is to be cut the jaws 17 may move upwardly to allow the collars on the pipe to pass. When the proper level has been reached to make the cut the device will be drawn upwardly to engage the jaws 17 with the pipe or with a collar on the pipe. It will be seen that when the jaws are moved upwardly they will be also moved inwardly due to the tapered contact of the jaws with the seat 20 on the adjusting sleeve.

When a firm tension is obtained holding the jaws firmly against the adjusting sleeve the frictional engagement will hold the adjusting sleeve stationary and the housing may then be rotated to screw the adjusting sleeve downwardly free of the thread 24 on the housing. When the adjusting sleeve is thus freed of its engagement with the housing it will drop downwardly until the lower end engages upon the shoulder 43 on the housing. The jaws 17 will also move downwardly, drawing the holding sleeve 12 therewith, compressing the spring 11.

As the adjusting sleeve is moved downwardly the links 26 will be allowed to drop and the shoe 7 secured thereto will also move downwardly relative to the housing and move the cutting points of the cutters 36 inwardly into contact with the pipe to be cut. The rotation of the housing thereafter will carry the cutters around the pipe to be cut and as the cutters move inwardly in the operation of cutting the pipe the shoe 7 will move relatively downward. When the cut has been entirely made the engagement of the device with the pipe, together with the upward tension maintained on the device will move the severed section of pipe upwardly and give a signal to the operator that the cut has been completed. If desired the severed section may be raised immediately to the surface. However, it is possible to release the tool from the severed section and move further down and cut a second section of pipe if desired. This is accomplished by moving the housing downwardly and screwing onto the adjusting sleeve 22 and moving it upwardly so as to draw the cutters into their original position, leaving the tool ready to continue operations.

It will be seen that the force tending to move the cutters inwardly during the cutting operation will be the weight of the shoe 7 together with the pressure of the spring 9, and it will be obvious that the spring 9 may be dispensed with where the weight of the shoe is sufficient. Also, if desired, the shoe may be made lighter and the spring stronger. In either case the force will be sufficient to move the cutters into engagement with the pipe to be cut.

The advantage of my device lies in the fact that it is simple in construction and easily operated to cut the pipe and to thereafter release the pipe if desired.

What I claim as new is:

1. An outside pipe cutter comprising a housing, a shoe telescoping over the lower end of said housing, cutters pivotally supported in said housing, gear teeth on one end of each of said cutters, a rack on said shoe engaging said teeth to move said cutters and means to prevent movement of said shoe to move said cutters, releasable by the rotation of said housing.

2. An outside pipe cutter comprising a housing, a shoe telescoping over the lower end of said housing, cutters pivotally supported in said housing, gear teeth on one end

of each of said cutters, a rack on said shoe engaging said teeth to move said cutters and means to prevent movement of said shoe to move said cutters, releasable by the rotation of said housing, said shoe being movable by gravity when released.

3. An outside pipe cutter comprising a housing, a shoe telescoping over the lower end of said housing, cutters pivotally supported in said housing, means on said shoe engaging said cutters to pivot the same to operative or inoperative position, and means to prevent movement of said shoe to move said cutters, releasable by the rotation of said housing.

4. An outside pipe cutter comprising a housing, cutters pivotally supported therein, a cutting point on each of said cutters extended downwardly, and means engaging the upper ends of said cutters and operable by rotation of said housing to be released and allowed to move downwardly by gravity and swing said cutters into operative position.

5. An outside pipe cutter comprising a housing, cutters pivotally supported therein, a cutting point on each of said cutters extended downwardly, and means engaging the upper ends of said cutters to cause pivoting of said cutters, means to prevent such movement releasable by the rotation of said housing and free thereafter to move said cutters to operative position.

6. An outside pipe cutter comprising a tubular housing, a lower cutter actuating shoe telescopically engaged therewith, an adjusting sleeve in said housing, means associated with said sleeve to support said shoe in an inoperative position, cutters in said housing below said sleeve, means on said shoe to engage and move said cutters, and pipe engaging means to abut said sleeve and hold it in stationary position with respect to said housing, said sleeve being releasable by relative rotation from said housing.

7. An outside pipe cutter comprising a tubular housing, a lower shoe telescopically engaged therewith, an adjusting sleeve in said housing, means associated with said sleeve to support said shoe, cutters in said housing below said sleeve, means on said shoe to positively engage and move said cutters to operative or inoperative position, means on said housing normally engaging said sleeve to hold the same rigidly against relative longitudinal movement and releasable by rotation of said housing to allow said shoe to move said cutters.

8. An outside pipe cutter including a tubular housing, cutters pivotally supported thereon, a shoe on said housing, means thereon to engage and move said cutters upon relative longitudinal movement of said shoe, an adjusting sleeve having a threaded engagement within said housing, links on said sleeve to support said shoe in an inoperative position and thus hold said cutters inoperative, and means operative upon the upward movement of said housing to engage and prevent rotation of said sleeve when said housing is rotated.

9. An outside pipe cutter including a body, cutters pivoted therein, a shoe arranged for relative longitudinal movement on said body, means on said shoe to move said cutters upon relative movement of said body and shoe, pipe engaging means in said body, and an adjustment sleeve threaded to said body and engageable by both said shoe and said pipe engaging means whereby it will be released from said housing on rotation thereof to release said shoe to actuate said cutters.

10. In an outside pipe cutter, a body, a guide sleeve mounted therein, pipe engaging slips supported by and slidable with respect to said sleeve, and an adjustment sleeve threaded to said body and engageable by said slips to hold said adjustment sleeve stationary when said slips engage a pipe so that the sleeve will be released from the body to actuate the cutter blades.

In testimony whereof I hereunto affix my signature this 1st day of April, A. D. 1930.

ERCOLE VENTRESCA.