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E. VENTRESCA

WELL CASING CUTTER

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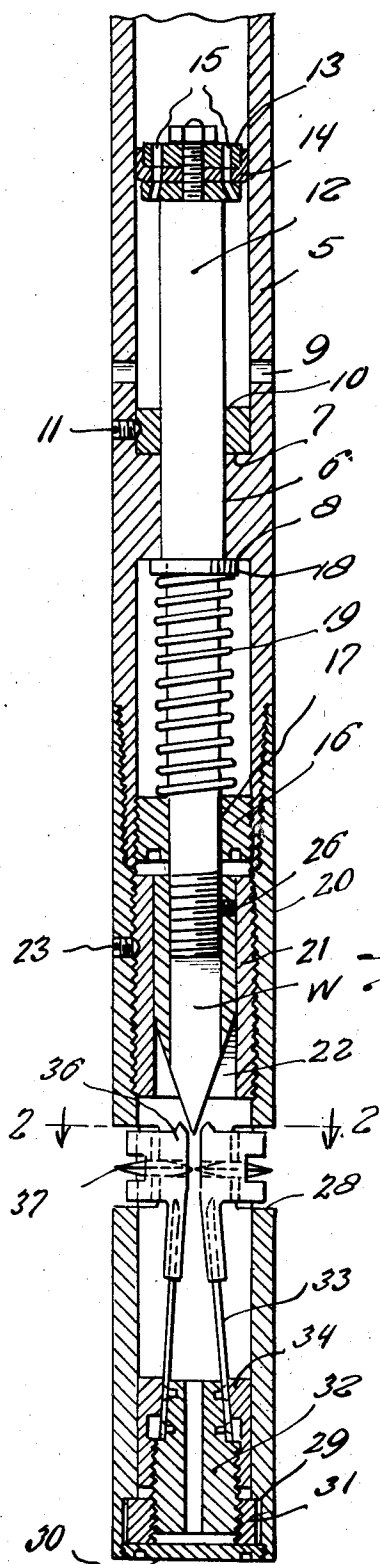


Fig. 1.

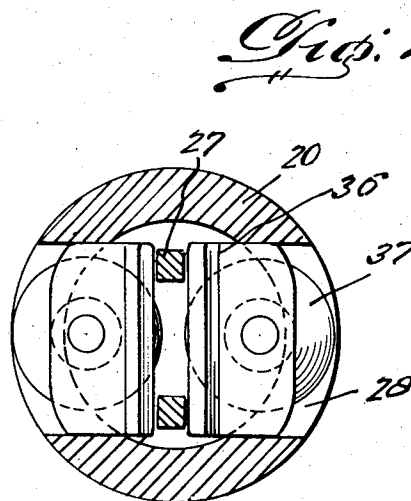


Fig. 2.

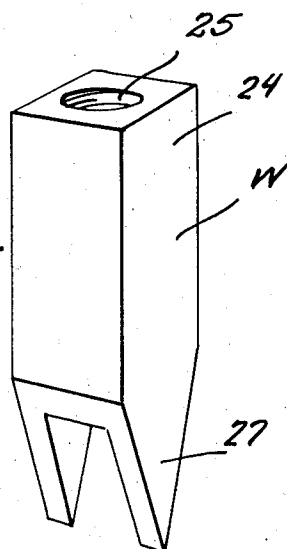


Fig. 3.

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WELL-CASING CUTTER.

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The present invention relates to a cutting mechanism for severing well cases when desired.

An important object of the invention is to generally improve upon devices of this nature by providing an exceeding simple construction which will prove thoroughly reliable and efficient in operation, strong and durable, not likely to easily become out of order, and to overcome the disadvantages usually encountered in devices designed for the same purpose now in common use.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawing:—

Figure 1 is a longitudinal vertical section through the contrivance embodying the features of my invention,

Fig. 2 is an enlarged transverse section taken substantially on the line 2—2 of Fig. 1, looking downwardly, and

Fig. 3 is a perspective view of the wedge element.

Referring to the drawing in detail, it will be seen that 5 designates a shell which is provided with an interior restricted portion 6 providing an upper shoulder 7. The shell 5 is provided with openings 9 above the shoulder 7. A collar 10 rests on the shoulder 7 below the openings 9 and is held in place by a set screw 11. A rod 12 is slidable through the collar 10 and restricted portion 6, and on the upper end thereof has a piston 13 provided with suitable packing 14 for engaging the interior surface of the shell 5. This piston is provided with a plurality of off center openings 15.

A plug 16 is threadedly mounted in the lower end of the shell 5 and has an opening 17 for receiving the rod 12. A collar 18 is fixed to the rod 12 below a shoulder 8 which is formed by the lower edge of the restricted portion 6. A spring 19 of the helical type is disposed about the rod 12 to impinge against the collar 18 and the plug 16 for normally holding said collar 18 in abutment with the lower shoulder 8.

A cylindrical casing 20 is threaded on the lower end of the shell 5 and has threaded in the upper portion thereof a guide sleeve 21 provided with a square bore 22. The

guide sleeve 21 is locked in the casing 20 by a set screw 23. A wedge element W includes a parallelopiped body 24 having a longitudinally extending threaded bore 25 for threadedly receiving the lower end of the rod 12, being locked in engagement therewith by a set screw 26. A pair of spaced parallel wedge plates 27 merge from the lower end of the body 24. The casing 20 is provided with a pair of diametrically opposed openings 28 disposed below the lower end of the guide sleeve 21.

A shoulder 29 is formed in the lower end of the casing 20. A cap 30 is threadedly engaged in said lower end of the casing and holds an annulus 31 in abutment with said shoulder 29. A member 32 is threadedly engaged in the annulus and rises upwardly in the casing. A pair of leaf springs 33 are fixed to the upper end of the member 31 and converge upwardly toward each other. A nut 34 is threaded on the member 32 and assists in holding the springs 33 securely on said member. A holder 36 is mounted on the upper end of each spring 33. Those holders are disposed inwardly of the openings 28 by the springs 33.

Disk cutters 37 are journaled in the holders 36. In using this device it will be understood that the shell 5 rotated in the usual manner after having been let down into the well casing which it is desired to cut. Water is pumped down into the shell and a portion thereof will pass through the passages 15, and out through the openings 9 for the purpose of lubricating the casing while being cut.

While the water is pumped into the shell, it will be seen that it cannot flow through the passages 15 fast enough and therefore the piston 13 will be forced downwardly, thus moving the rod 12 downwardly, and the wedge element W downwardly, so that the wedge plates 27 engage between the holders 36 and force them outwardly through the openings 28, and thus the well casing will be cut from the inside, outwardly, and when the cutters have cut through the resistance offered by the holders 36 to the downward movement of the wedge element W, will seat, so that the piston 13 will abut the collar 10, thus closing the passages 15 and the openings 9 so that the water will back up, thereby notifying the operator that the well casing has been severed.

It is thought that the construction, operation, utility, and advantages of this invention will now be clearly understood without a more detailed description thereof. The present embodiment of the invention has been disclosed in detail merely by way of example, since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of constructions, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:—

1. A device of the class described including, in combination, a shell having a restricted interior portion forming an upper and a lower shoulder and openings above the upper shoulder, a rod slidable in the shell through the restricted portion, a piston at the upper end of the rod, a collar about the rod and fixed to the seat on the upper shoulder, said piston having passages extending therethrough so that when the piston abuts the collar, both the openings and the passages are closed, a stop collar on the rod below the lower shoulder, an apertured plug in the lower end of the shell through which the rod extends, a spring on the rod impinging against the stop collar and the plug to normally hold the stop collar against the lower shoulder, a cylindrical casing threadedly engaged with the lower end of the shell, a guide sleeve threaded in the upper portion of the casing, a wedge element slidable through the guide sleeve and connected to the rod, the intermediate portion of the casing below the sleeve being provided with diametrically opposed openings, a shoulder formed interiorly of the lower end of the casing, an internally threaded annulus in the lower end of the casing, a cap threaded in the lower end of the casing to hold the annulus in abutment with the last mentioned shoulder, a member threaded in the annulus and extending upwardly therefrom, a pair of leaf springs fixed at their lower ends to the upper end of the member to extend upwardly therefrom and converge toward each other, holders on the upper ends of the springs opposite the openings in the casing, and disk cutters journaled in the holders, said wedge element adapted to engage between the holders to force them toward the openings in the casing.

2. A device of the class described including, in combination, a shell having a restricted interior portion forming an upper and a lower shoulder, openings above the upper shoulder, a rod slidable in the shell through

the restricted portion, a piston at the upper end of the rod, a collar about the rod and fixed to seat on the upper shoulder, said piston having passages extending therethrough, so that when the piston abuts the collar both the openings and the passages are closed, a stop collar on the rod below the lower shoulder, means for normally holding said stop collar in engagement with the lower shoulder, a casing threadedly on the lower end of the shell, cutting means in the casing, and an operating member for the cutting means on the rod.

3. A device of the class described including, in combination, a shell having a restricted interior portion forming an upper and a lower shoulder and openings above the upper shoulder, a rod slidable in the shell through the restricted portion, a piston at the upper end of the rod, a collar about the rod and fixed to seat on the upper shoulder, said piston having passages extending therethrough so that when the piston abuts the collar, the openings and the passages are closed, a stop collar on the rod below the shoulder, an apertured plug on the lower end of the shell thru which the rod extends, a spring on the rod impinging against the stop collar and the plug to normally hold the stop collar against the lower shoulder, a cylindrical casing threadedly engaged with the lower end of the shell, a guide sleeve threaded in the upper portion of the casing and having a square bore, a wedge element including a parallelopiped body threaded on the lower end of the rod and slidable in the bore of the guide sleeve, and a pair of spaced parallel wedge plates merging from the bottom end of the body, a pair of springs mounted in the lower end of the sleeve extending upwardly and converging inwardly toward each other, said casing provided with openings opposite the upper terminals of the springs, holders on the upper ends of the springs, and disk cutters journaled in the holders.

4. A device of the class described including, in combination, a shell having a restricted interior portion forming an upper and a lower shoulder, and openings above the upper shoulder, a rod slidable in the shell thru the restricted portion, a piston at the upper end of the rod, a collar about the rod and fixed to seat on the upper shoulder, said piston having passages extending therethru, so that when the piston abuts the collar, both the openings and the passages are closed, a stop collar on the rod below the lower shoulder, an apertured plug in the lower end of the shell through which the rod extends, means on the rod for normally holding the stop collar in engagement with the lower shoulder, a casing engaged on the lower end of the shell, a guide sleeve threaded in the upper portion of the casing and

having a square bore, a wedge element including a parallelopiped body threaded on the lower end of the rod and slidable in the bore of the guide sleeve, and a pair of spaced parallel wedge plates merging from the bottom end of the body, the intermediate portions of the casings below the sleeve being provided with diametrically opposed openings, a member mounted in the lower end of the casing, a pair of leaf springs fixed at their lower ends to the upper end of said member to extend upwardly therefrom and converge toward each other, holders on the upper ends of the springs opposite the openings of the casing, and disk cutters journaled in the holders.

5. A device of the class described including, in combination, a shell having a restricted interior portion forming an upper and a lower shoulder, a rod slidable in the shell through the restricted portion, a piston at the upper end of the rod, a stop collar on the rod below the lower shoulder, an aper-

tured plug in the lower end of the shell through which the rod extends, a spring on the rod impinging against the stop collar and the plug to normally hold the stop collar against the lower shoulder, a cylindrical casing threadedly engaged on the lower end of the shell, a guide sleeve threaded in the upper portion of the casing and having a square bore, a wedge element including a parallelopiped body threaded on the lower end of the rod and slidable in the bore of the guide sleeve, a pair of spaced parallel wedge plates merging from the bottom end of the body, the sleeve being provided with diametrically opposed openings, inwardly spring pressed holders mounted in the casing opposite the openings therein, said wedging element adapted to move down between the holders to force them out through the opening and cutting means in the holders.

In testimony whereof I affix my signature.

ERCOLE VENTRESCA.