OIL WELL CASING CUTTER FOR SIDE WINDOWS

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FIG. 1

FIG. 2

FIG. 3

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This invention relates to an oil well casing cutter in which the side window is cut in the casing, particularly when that casing has been bent or curved in a horizontal plane due to the lateral shifting of the formation through which the casing passes. When the casing is thus curved or bent, it is necessary to straighten the hole as much as possible, and this is accomplished by cutting out one side of the casing, i.e., cutting a window therein and then inserting a liner, thus eliminating any abrupt angle or curve in the pipe and straightening the pipe to a degree necessary to subsequently insert tools in the well.

An object of my invention is to provide a casing cutter or reamer, which will cut through one side of the pipe, thus forming a window therein, and which is effectively guided while so cutting or reaming the pipe.

Another object of my invention is to provide a novel casing cutter for oil wells in which the guide shoe is rotatably mounted on the bottom of the tool and this guide shoe acts to press the cutter against the high side of the bent casing, thus cutting a window in this high side.

A feature of my invention is to provide a novel casing cutter of the character stated, in which the guide shoe is so constructed and mounted that it will hold the cutter against the high side of the bent casing at all times, and will thus cut only on the high side thereby permitting a liner to be inserted at the bent portion of the casing.

Other objects, advantages and features of my invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

In the drawings:

Figure 1 is a partial longitudinal sectional view of my casing cutter, in position in a bent casing.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a sectional view taken on line 3—3 of Figure 1.

Referring more particularly to the drawing, the numeral 1 indicates the pipe or casing which is usually run into an oil well, and due to lateral shifting of the formation this casing is bent or curved, as shown at 2. At this bent portion of the casing, the side 3 will be termed the low side and the side 4 will be termed the high side of the bent portion of the casing. It will be evident that if a liner is to be inserted to eliminate the abrupt bend 2, then a hole or window must be cut in the high side 4 so that a liner can be inserted to connect the upper and lower straight portions of the casing 1.

My improved casing cutter consists of a cutter head 5, which is threaded on to the lower end of the drill pipe 6, in the usual and well known manner. The reaming blades or cutters 7 are formed on the outside of the head 5, and these cutting surfaces may be tapered, if desired. A fluid passage 8 extends longitudinally through the head 5 so that fluid can pass through the tool, all of which is usual and well known.

The shoe 9 is rotatably mounted on the bottom of the head 5 and 1 provide an annular thrust bearing 10 between the bottom of the head 5 and the top of the shoe 9, substantially as shown. I also provide a plurality of radial bearings 11 to take the radial thrust on the shoe 9. A fluid passage 12 extends longitudinally through the shoe 9 so that fluid can pass through the tool. The bottom of the shoe 9 is eccentrically pointed, as shown at 13, the purpose of this curved or eccentric surface being to hold the shoe against rotation when the tool is in operation, and also to form a wedge which tends to press the cutter head 5 against the high side 4 of the casing.

When the head 5 is so pressed against the high side 4 and is rotated by the drill pipe 6, a window 14 will be cut in the casing on the high side 4, thus enabling a liner to be subsequently inserted on the inside of the casing. The bearings 10 and 11 will permit the head 5 to rotate freely while the shoe 9 is engaging the walls of the casing and is also acting to press the cutter blade 7 against the high side of the casing.

Having described my invention, I claim:

1. An oil well casing cutter to cut side windows in misaligned pipe sections with an inclined pipe section connecting the misaligned sections, comprising a cutter head, cutter blades on the outside of said head, pipe coupling means on the upper end of said head, pipe extending longitudinally therethrough, a guide shoe rotatably mounted on the lower end of said head, anti-friction bearings positioned between the guide shoe and said head whereby the shoe is rotatably mounted, an eccentric point on the bottom of the guide shoe engaging the inclined section of the casing to press the cutter head against one side of the casing, and said guide shoe having a fluid passage extending longitudinally therethrough.

2. An oil well casing cutter to cut side windows in misaligned pipe sections with an inclined pipe section connecting the misaligned sections, comprising a cutter head, cutter blades on the outside of said head, pipe coupling means on the upper end of said head, said head having a fluid passage extending longitudinally therethrough, a guide...
shoe mounted on the lower end of said head, anti-friction bearings positioned between the guide shoe and said head whereby the shoe is rotatably mounted, said guide shoe engaging the inclined section of the casing to press the cutter head against one side of the casing, said cutter head being tapered from the top to the bottom thereof, an eccentric point on the bottom of said shoe and an inclined surface extending from the point, and said shoe having a fluid passage extending longitudinally therethrough.

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