



US005853056A

United States Patent [19]

[11] Patent Number: **5,853,056**

Landers

[45] Date of Patent: **Dec. 29, 1998**

[54] **METHOD OF AND APPARATUS FOR HORIZONTAL WELL DRILLING**

[76] Inventor: **Carl W. Landers**, 141 S. Union St.,
Madisonville, Ky. 42431

[21] Appl. No.: **624,438**

[22] PCT Filed: **Sep. 26, 1994**

[86] PCT No.: **PCT/US94/10892**

§ 371 Date: **Apr. 1, 1996**

§ 102(e) Date: **Apr. 1, 1996**

[87] PCT Pub. No.: **WO95/09963**

PCT Pub. Date: **Apr. 13, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 131,526, Oct. 1, 1993, Pat.
No. 5,413,184.

[51] Int. Cl.⁶ **E21B 07/08**

[52] U.S. Cl. **175/424; 175/62; 175/73;**
299/17; 166/117.5

[58] Field of Search **175/61, 62, 424,**
175/75; 299/16, 17

[56] References Cited

U.S. PATENT DOCUMENTS

Re. 33,660	8/1991	Jelsma .	
1,367,042	2/1921	Granville .	
1,485,615	3/1924	Jones .	
1,733,311	10/1929	McNeill .	
2,065,436	12/1936	Ervin .	
2,251,916	8/1941	Cross .	
2,271,005	1/1942	Grebe .	
2,345,816	4/1944	Hays .	
3,191,697	6/1965	Haines .	
3,262,508	7/1966	Price .	
3,536,151	10/1970	Aarup .	
3,670,831	6/1972	Winter, Jr. .	
3,838,736	10/1974	Driver .	
3,840,079	10/1974	Williamson .	
3,853,185	12/1974	Dahl et al. .	
3,873,156	3/1975	Jacoby	299/4

3,958,649	5/1976	Bull et al.	175/61
4,007,797	2/1977	Jeter .	
4,168,752	9/1979	Sabol	175/12
4,185,705	1/1980	Bullard .	
4,365,676	12/1982	Boyadjieff et al.	175/61
4,368,786	1/1983	Cousins	175/78
4,445,574	5/1984	Vann	175/268
4,526,242	7/1985	Mathieii et al.	175/94
4,527,639	7/1985	Dickinson III et al.	175/61
4,533,182	8/1985	Richards	299/2
4,589,499	5/1986	Behrens	173/22

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

702530	4/1931	France .
1289136	2/1962	France .
2091931	1/1971	France .
2232669	1/1975	France .
485867	12/1927	Germany .

Primary Examiner—Terry Lee Melius
Attorney, Agent, or Firm—Middleton & Reutlinge; Charles
G. Lamb

[57] ABSTRACT

A method and apparatus for penetrating a well casing (12) and surrounding earth strata includes the insertion of a flexible shaft (24) having a ball cutter (22) on an end thereof into upset tubing (18) within a well casing. The upset tubing is provided with an elbow (20) at its lower extremity for receiving the ball cutter therein. The flexible shaft is then rotated and the ball cutter cuts a hole in the well casing and is then moved horizontally a distance, usually less than 12 inches (30.5 cm). The flexible shaft and ball cutter are then removed and a flexible tube (48) having a nozzle blaster (46) on an end thereof is then inserted into the upset tubing in the channel. A fluid of surfactant and water at high pressure is then pumped into the tube wherein the high pressure fluid passes through orifice in the spiral drill thereby cutting an extension into the previously cut channel. The tube is continually fed into the channel as the high pressure fluid continues to blast away the earth's strata. The channel is then cut a preselected distance from the well up to 200 feet (61 meters) and beyond.

14 Claims, 5 Drawing Sheets

