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**Frazier**

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(54) **BOTTOM SET DOWNHOLE PLUG**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

2,593,520 A 10/1945 Baker et al.  
2,616,502 A 3/1948 Lenz  
2,756,827 A 6/1948 Farrar  
2,737,242 A 8/1952 Baker  
2,640,546 A 6/1953 Baker et al.  
2,833,354 A 2/1955 Sailer  
3,054,453 A 3/1955 Bonner  
2,713,910 A 7/1955 Baker et al.

(Continued)

FOREIGN PATENT DOCUMENTS

GB 914030 12/1962

(Continued)

OTHER PUBLICATIONS

"Halliburton Services, Sales & Service Catalog No. 43," Halliburton Co., 1985 (202 pages).

(Continued)

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(51) **Int. Cl.**  
**E21B 33/129** (2006.01)

(52) **U.S. Cl.** ..... **166/124**; 165/133; 165/135

(58) **Field of Classification Search** ..... 166/123,  
166/124, 135, 138, 193

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

RE17,217 E 2/1929 Burch  
2,040,889 A 5/1933 Whinnen  
2,223,602 A 10/1938 Cox  
2,286,126 A 7/1940 Thornhill  
2,376,605 A 5/1945 Lawrence

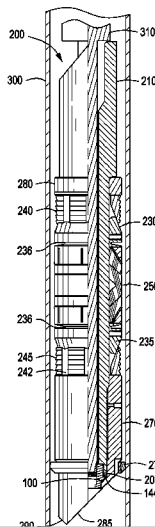
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(57) **ABSTRACT**

A plug for isolating a wellbore. The plug can include a body having a first end and a second end, wherein the body is formed from one or more composite materials and adapted to receive a setting tool through the first end thereof, at least one malleable element disposed about the body, at least one slip disposed about the body, at least one conical member disposed about the body, and one or more shearable threads disposed on an inner surface of the body, adjacent the second end thereof, wherein the one or more shearable threads are adapted to receive at least a portion of a setting tool that enters the body through the first end thereof, and wherein the one or more shearable threads are adapted to engage the setting tool when disposed through the body and adapted to release the setting tool when exposed to a predetermined axial force.

**20 Claims, 7 Drawing Sheets**



U.S. PATENT DOCUMENTS

2,714,932	A	8/1955	Thompson	6,629,563	B2	10/2003	Doane
2,830,666	A	7/1956	Rhodes	6,695,049	B2	2/2004	Ostocke et al.
3,062,296	A	12/1960	Brown	6,708,770	B2	3/2004	Slup et al.
3,013,612	A	12/1961	Angel	6,725,935	B2	4/2004	Szarka et al.
3,082,824	A	3/1963	Taylor et al.	6,769,491	B2	8/2004	Zimmerman et al.
3,160,209	A	* 12/1964	Bonner ..... 166/63	6,796,376	B2	9/2004	Frazier
3,163,225	A	12/1964	Perkins	6,799,633	B2	10/2004	McGregor
3,273,588	A	9/1966	Dollison	6,834,717	B2	12/2004	Bland
3,282,342	A	11/1966	Mott	6,851,489	B2	2/2005	Hinds
3,291,218	A	12/1966	Lebourg	6,902,006	B2	6/2005	Myerley et al.
3,298,440	A	1/1967	Current	6,918,439	B2	7/2005	Dallas
3,308,895	A	3/1967	Oxford et al.	6,938,696	B2	9/2005	Dallas
3,356,140	A	12/1967	Young	7,021,389	B2	4/2006	Bishop et al.
3,393,743	A	7/1968	Stanescu	7,040,410	B2	5/2006	McGuire et al.
3,429,375	A	2/1969	Craig	7,055,632	B2	6/2006	Dallas
3,517,742	A	6/1970	Williams	7,069,997	B2	7/2006	Coyes et al.
3,554,280	A	1/1971	Tucker	7,107,875	B2	9/2006	Haugen et al.
3,687,202	A	8/1972	Young et al.	7,128,091	B2	10/2006	Istre, Jr.
3,818,987	A	6/1974	Ellis	7,281,584	B2	10/2007	McGarian et al.
3,851,706	A	12/1974	Ellis	7,325,617	B2	2/2008	Murray
3,860,066	A	1/1975	Pearce et al.	7,337,847	B2	3/2008	McGarian et al.
3,926,253	A	12/1975	Duke	7,350,582	B2	4/2008	McKeachnie et al.
4,049,015	A	9/1977	Brown	7,527,104	B2	5/2009	Branch et al.
4,134,455	A	1/1979	Read	7,552,779	B2	6/2009	Murray
4,185,689	A	1/1980	Harris	7,604,058	B2	10/2009	McGuire
4,314,608	A	2/1982	Richardson	7,637,326	B2	12/2009	Bolding et al.
4,391,547	A	7/1983	Jackson	7,644,767	B2	1/2010	Kalb et al.
4,405,017	A	9/1983	Allen et al.	7,644,774	B2	1/2010	Branch et al.
4,432,418	A	2/1984	Mayland	7,673,677	B2	3/2010	King et al.
4,436,151	A	3/1984	Callihan et al.	7,740,079	B2	6/2010	Clayton et al.
4,437,516	A	3/1984	Cockrell	7,775,286	B2	8/2010	Duphorne
4,457,376	A	7/1984	Carmody et al.	7,775,291	B2	8/2010	Jacob
4,493,374	A	1/1985	Magee, Jr.	7,784,550	B2	8/2010	Nutley et al.
4,532,995	A	8/1985	Kaufman	7,798,236	B2	9/2010	McKeachnie et al.
4,554,981	A	11/1985	Davies	7,810,558	B2	10/2010	Shkurti et al.
4,566,541	A	1/1986	Moussy et al.	7,866,396	B2	1/2011	Rytlewski
4,585,067	A	4/1986	Blizzard et al.	7,878,242	B2	2/2011	Gray
4,595,052	A	6/1986	Kristiansen	7,886,830	B2	2/2011	Bolding et al.
4,602,654	A	7/1986	Stehling et al.	7,909,108	B2	3/2011	Swor et al.
4,688,641	A	8/1987	Knieriemmen	7,909,109	B2	3/2011	Angman et al.
4,708,163	A	11/1987	Deaton	7,918,278	B2	4/2011	Barbee
4,708,202	A	11/1987	Sukup et al.	7,921,923	B2	4/2011	McGuire
4,776,410	A	10/1988	Perkin et al.	7,921,925	B2	4/2011	Maguire et al.
4,784,226	A	11/1988	Wyatt	7,926,571	B2	4/2011	Hofman
4,792,000	A	12/1988	Perkin et al.	2003/0024706	A1	2/2003	Allamon
4,830,103	A	5/1989	Blackwell et al.	2003/0188860	A1	10/2003	Zimmerman et al.
4,848,459	A	7/1989	Blackwell et al.	2007/0051521	A1	3/2007	Fike et al.
4,893,678	A	1/1990	Stokley et al.	2007/0107908	A1	5/2007	Vaidya et al.
5,020,590	A	6/1991	McLeod	2008/0060821	A1	3/2008	Smith et al.
5,095,980	A	3/1992	Watson	2008/0110635	A1	5/2008	Loretz et al.
5,113,940	A	5/1992	Glaser	2009/0114401	A1	5/2009	Purkis
5,117,915	A	6/1992	Mueller et al.	2009/0211749	A1	8/2009	Nguyen et al.
5,154,228	A	10/1992	Gambertoglio et al.	2010/0084146	A1	4/2010	Roberts
5,183,068	A	2/1993	Prosser	2010/0101807	A1	4/2010	Greenlee et al.
5,188,182	A	2/1993	Echols, III et al.	2010/0132960	A1	6/2010	Shkurti et al.
5,207,274	A	5/1993	Streich et al.	2010/0155050	A1	6/2010	Frazier
5,209,310	A	5/1993	Clydesdale	2010/0252252	A1	10/2010	Harris et al.
5,224,540	A	7/1993	Streich et al.	2010/0263876	A1	10/2010	Frazier
5,230,390	A	7/1993	Zastresak et al.	2010/0276159	A1	11/2010	Mailand et al.
5,234,052	A	8/1993	Coone et al.	2010/0288503	A1	11/2010	Cuiper et al.
5,253,705	A	10/1993	Clary et al.	2011/0036564	A1	2/2011	Williamson
5,311,939	A	5/1994	Pringle et al.	2011/0061856	A1	3/2011	Kellner et al.
5,316,081	A	5/1994	Baski et al.	2011/0088915	A1	4/2011	Stanojcic et al.
5,343,954	A	9/1994	Bohlen et al.	2011/0103915	A1	5/2011	Tedeschi
5,419,399	A	5/1995	Smith				
5,564,502	A	10/1996	Crow et al.				
5,593,292	A	1/1997	Ivey et al.	WO	WO 2010127457	11/2010	
5,803,173	A	9/1998	Fraser, III et al.				
5,810,083	A	9/1998	Kilgore				
6,012,519	A	1/2000	Allen et al.				
6,098,716	A	8/2000	Hromas et al.				
6,142,226	A	11/2000	Vick				
6,152,232	A	11/2000	Webb et al.				
6,167,963	B1	1/2001	McMahan et al.				
6,182,752	B1	2/2001	Smith, Jr. et al.				
6,199,636	B1	3/2001	Harrison				

FOREIGN PATENT DOCUMENTS

WO WO 2010127457 11/2010

OTHER PUBLICATIONS

- “Alpha Oil Tools Catalog,” Alpha Oil Tools, 1997 (136 pages).
- “Teledyne Merla Oil Tools-Products-Services,” Teledyne Merla, Aug. 1990 (40 pages).
- “78/79 Catalog: Packers-Plugs-Completions Tools,” Pengo Industries, Inc., 1978-1979 (12 pages).
- “MAP Oil Tools Inc. Catalog,” MAP Oil Tools, Apr. 1999 (46 pages).

"Halliburton Services, Sales & Service Catalog," Halliburton Services, 1970-1971 (2 pages).

"1975-1976 Packer Catalog," Gearhart-Owen Industries Inc., 1975-1976 (52 pages).

"Formation Damage Control Utilizing Composite-Bridge Plug Technology for Monobore, Multizone Stimulation Operations," Gary Garfield, SPE, May 15, 2001 (8 pages).

"Composite Bridge Plug Technique for Multizone Commingled Gas Wells," Gary Garfield, SPE, Mar. 24, 2001 (6 pages).

"Composite Research: Composite bridge plugs used in multi-zone wells to avoid costly kill-weight fluids," Gary Garfield, SPE, Mar. 24, 2001 (4 pages).

"It's About Time—Quick Drill Composite Bridge Plug," Baker Oil Tools, Jun. 2002 (2 pages).

"Baker Hughes—Baker Oil Tools—Workover Systems—QUICK Drill Composite Bride Plug," Baker Oil Tools, Dec. 2000 (3 pages).

"Baker Hughes 100 Years of Service," Baker Hushes in Depth, Special Centennial Issue, Publication COR-07-13127, vol. 13, No. 2, Baker Hughes Incorporated, Jul. 2007 (92 pages).

\* cited by examiner

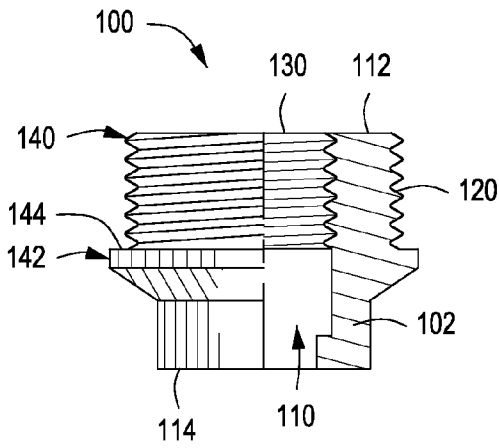


FIG. 1A

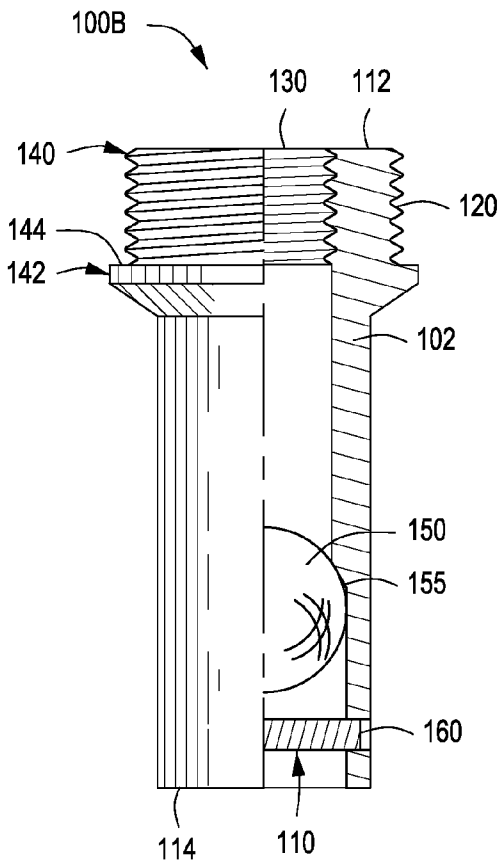


FIG. 1B

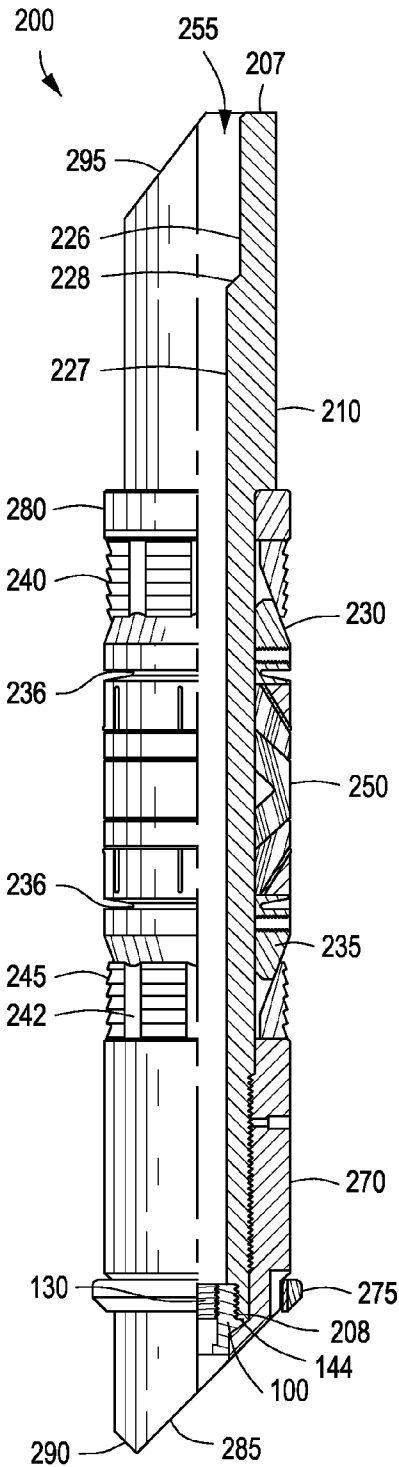


FIG. 2A

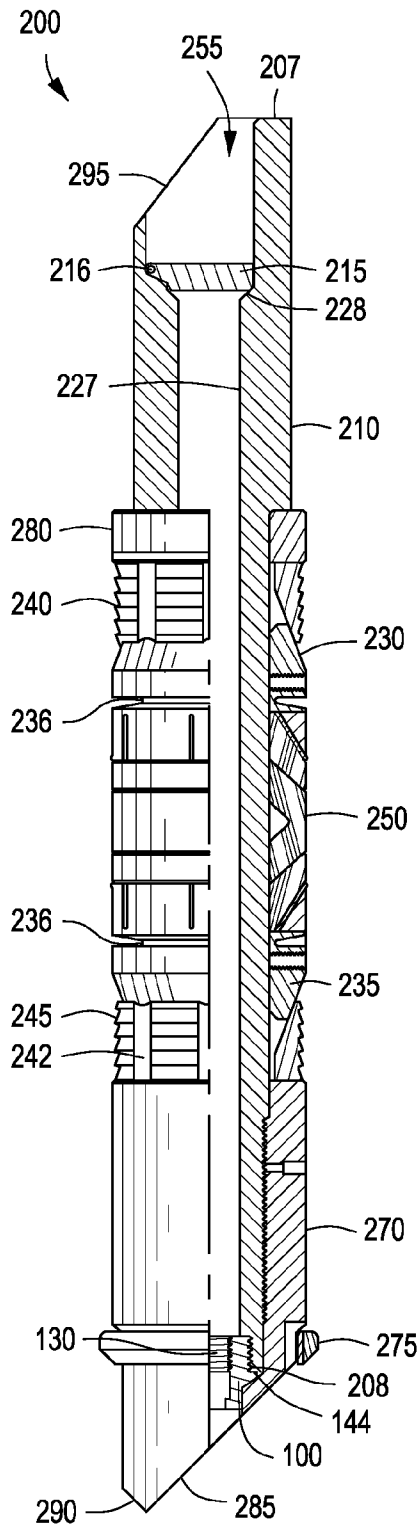


FIG. 2B

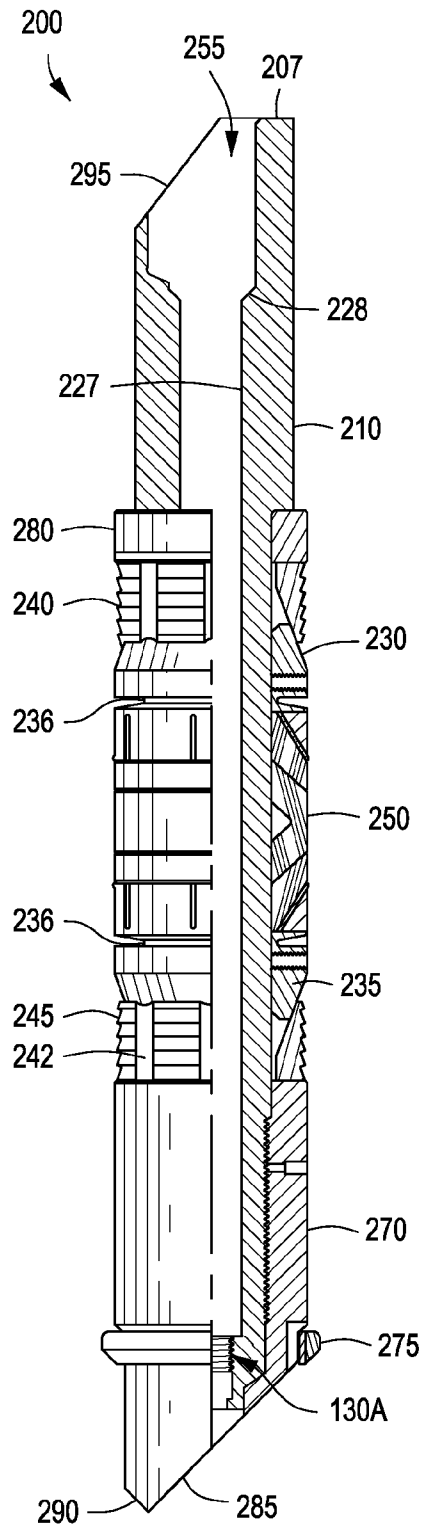


FIG. 2C

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