

# Ex. PGS 1017

[54] **DEVICE AND METHOD FOR POSITIONING OF TOWING SYSTEMS FOR USE IN MARINE SEISMIC SURVEYS**

5,443,027 8/1995 Owsley et al. .... 114/244

**FOREIGN PATENT DOCUMENTS**

[75] **Inventor:** **Tor Elholm, Hosle, Norway**

0018053	10/1980	European Pat. Off. .	
0154968	9/1985	European Pat. Off. .	
2223798	9/1973	Germany .	
3737490	4/1992	Germany .	
151735	2/1985	Norway .	
158970	8/1988	Norway .	
1104454	7/1984	U.S.S.R. ....	367/16
1551635	8/1979	United Kingdom .	
2193476	2/1988	United Kingdom .	
2248587	4/1992	United Kingdom .	

[73] **Assignee:** **Geco A.S., Stavanger, Norway**

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[30] **Foreign Application Priority Data**

Feb. 23, 1993 [NO] Norway ..... 930641

[51] **Int. Cl.<sup>6</sup>** ..... **G01V 1/38; B63B 21/66**

[52] **U.S. Cl.** ..... **367/16; 114/244; 367/20**

[58] **Field of Search** ..... **367/16, 17, 18, 367/20, 106; 114/244, 245, 246**

*Primary Examiner*—Charles T. Jordan  
*Assistant Examiner*—Theresa M. Wesson  
*Attorney, Agent, or Firm*—Jacobson, Price, Holman & Stern

[57] **ABSTRACT**

A positioning device for seismic equipment which is towed by a seismic vessel is designed with a body part which is equipped with wings (7) and rudders (8, 6, 9, 5). For the control of wings (7) and rudders (8, 6, 9, 5) control means, preferably hydraulic or electrical means are used. The device further comprises a control unit for processing of signals which preferably operate exclusively on the basis of information from the vessel or the ship, instruments for use in the positioning of the device and a communication system for the communication between the vessel and the device and vice versa, preferably electrical, acoustic or optical. It is further equipped with attachment devices for one or more cables (26) and floats, which are preferably provided at the front of the device, and preferably in the vicinity of the wing's (7) attachment point to the device's body part as well as a power supply system.

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

3,434,451	3/1969	Brainard, II	367/18
3,605,674	9/1969	Weese	114/235 B
3,774,570	11/1973	Pearson	114/235 B
4,063,213	12/1977	Itria et al.	367/17
4,087,780	5/1978	Itria et al.	367/17
4,227,479	10/1980	Gertler et al.	114/244
4,323,989	4/1982	Huckabee et al.	367/17
4,404,664	9/1983	Zachariadis	367/19
4,463,701	8/1984	Pickett et al.	114/245
4,484,534	11/1984	Thillaye duBoullay	114/244
4,723,501	2/1988	Hovden et al.	367/16
4,729,333	3/1988	Kirby et al.	114/244
4,890,568	1/1990	Dolengowski	114/246
5,052,814	10/1991	Stubblefield	367/16
5,357,892	10/1994	Vatne et al.	114/244
5,402,745	4/1995	Wood	114/244

**24 Claims, 5 Drawing Sheets**

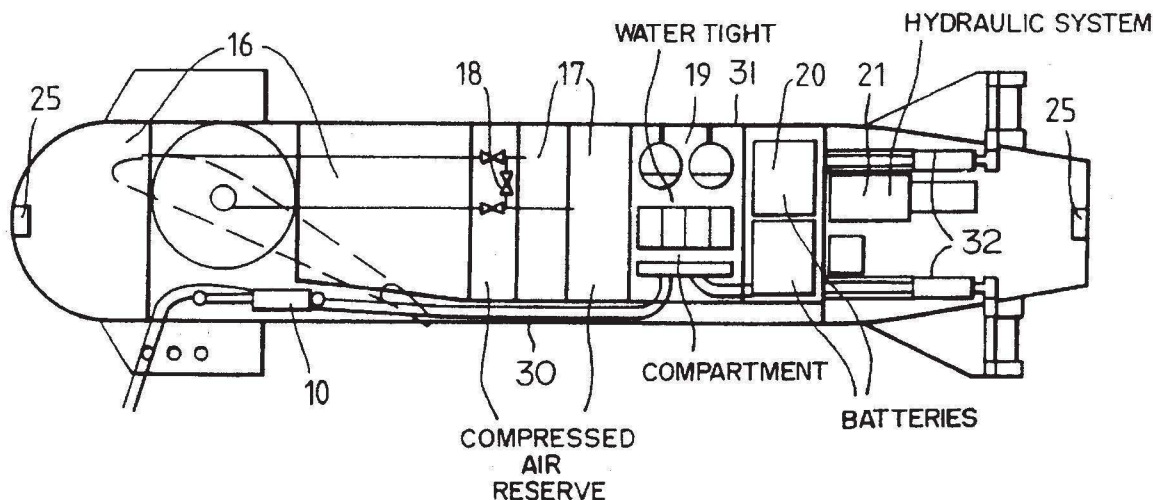


Fig. 1.  
(PRIOR ART)

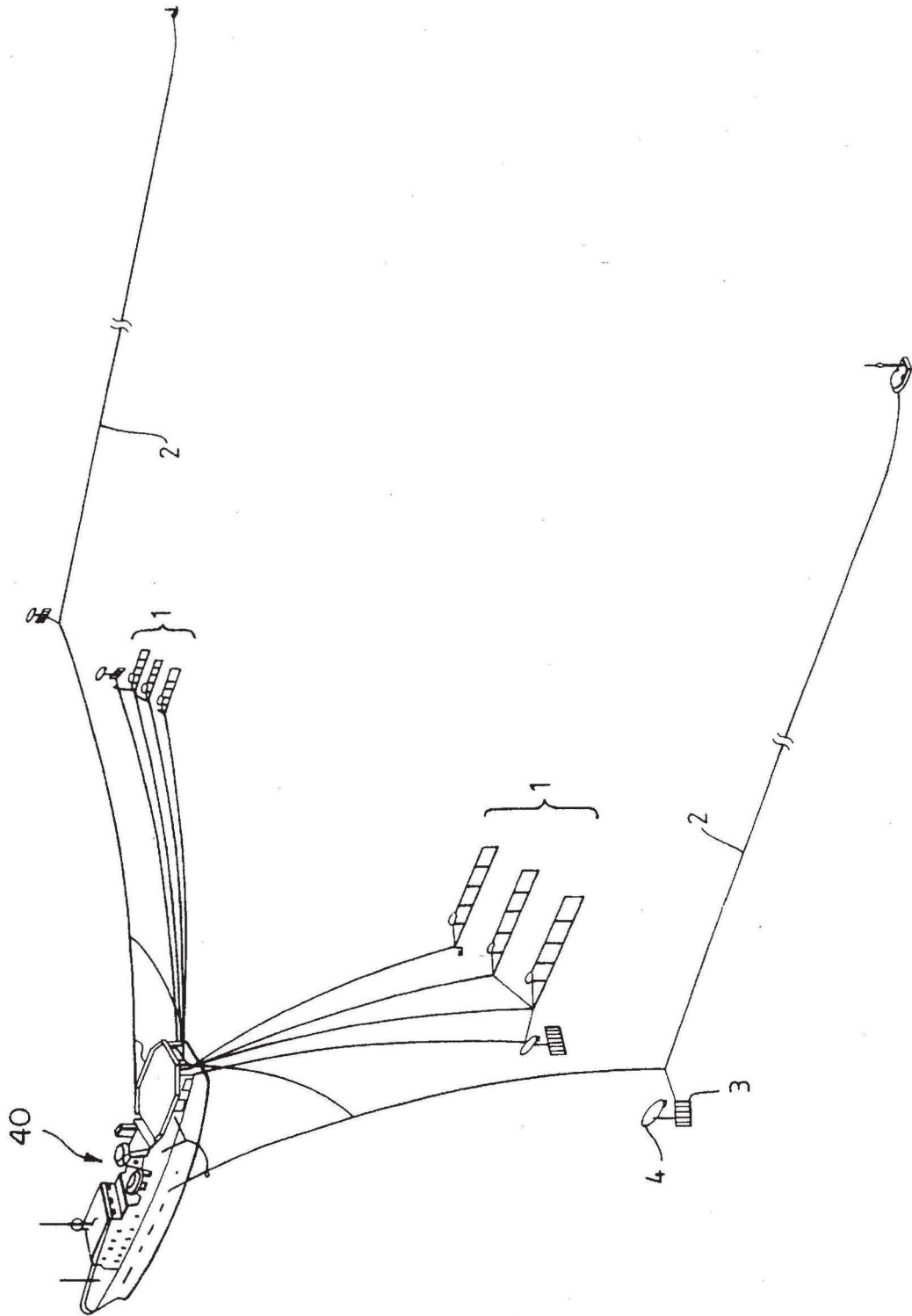


Fig. 2a.

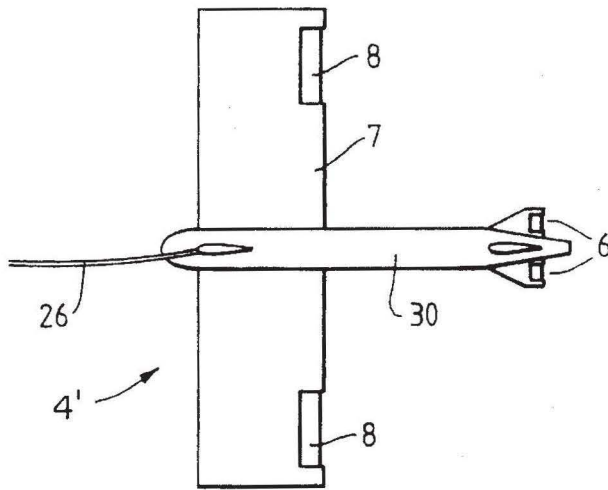


Fig. 2b.

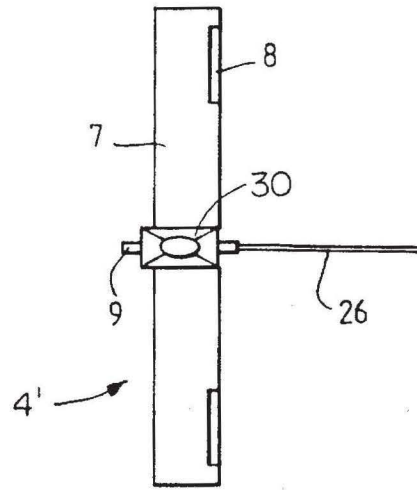


Fig. 2c.

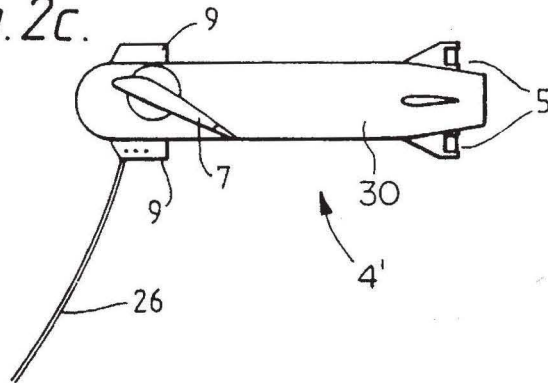


Fig. 3.

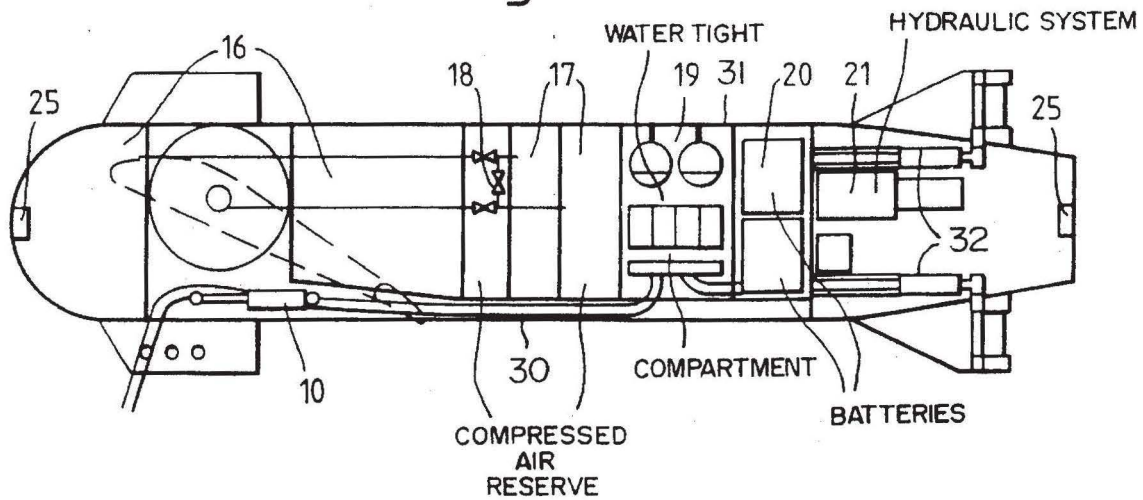


Fig. 4.

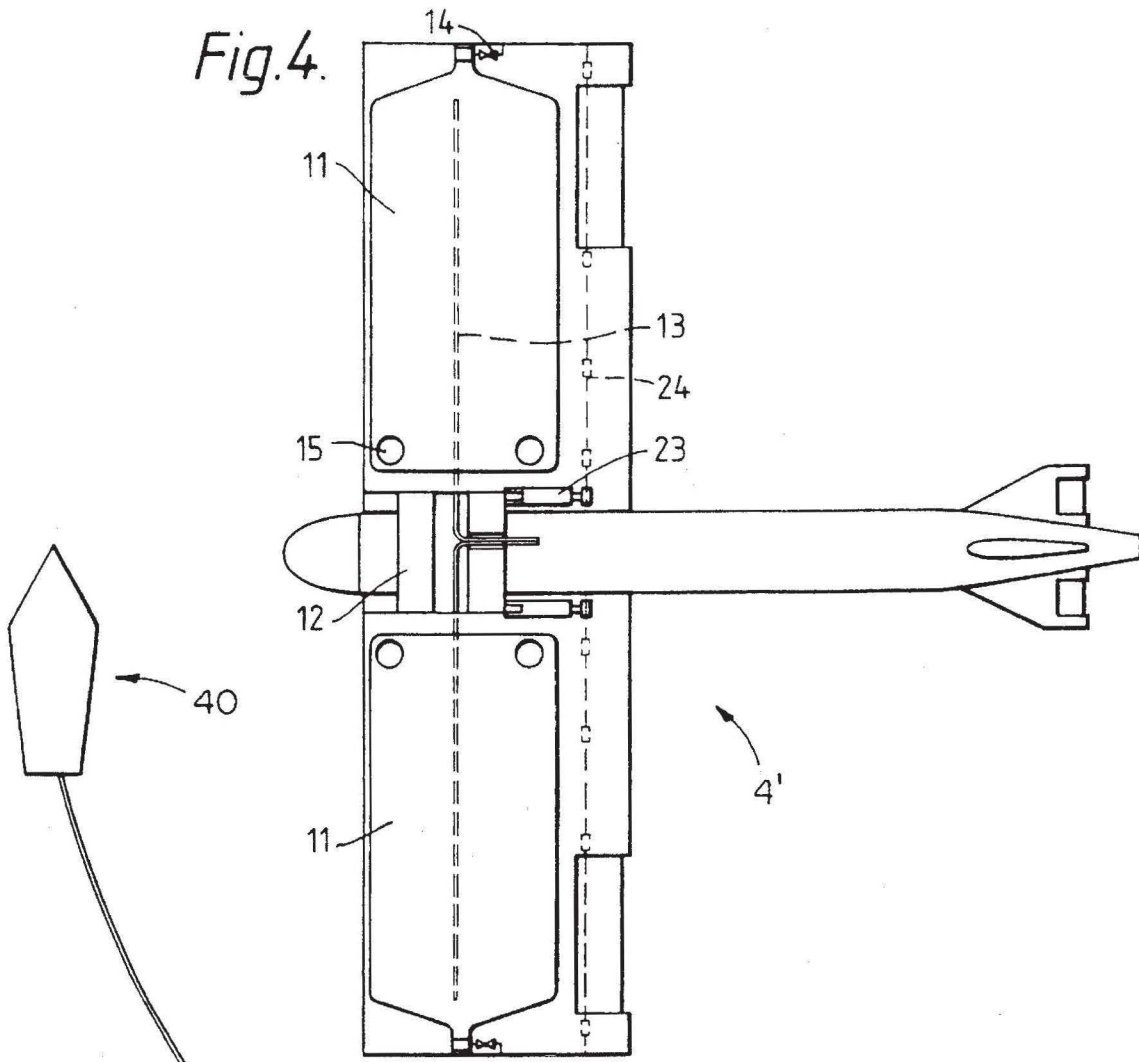
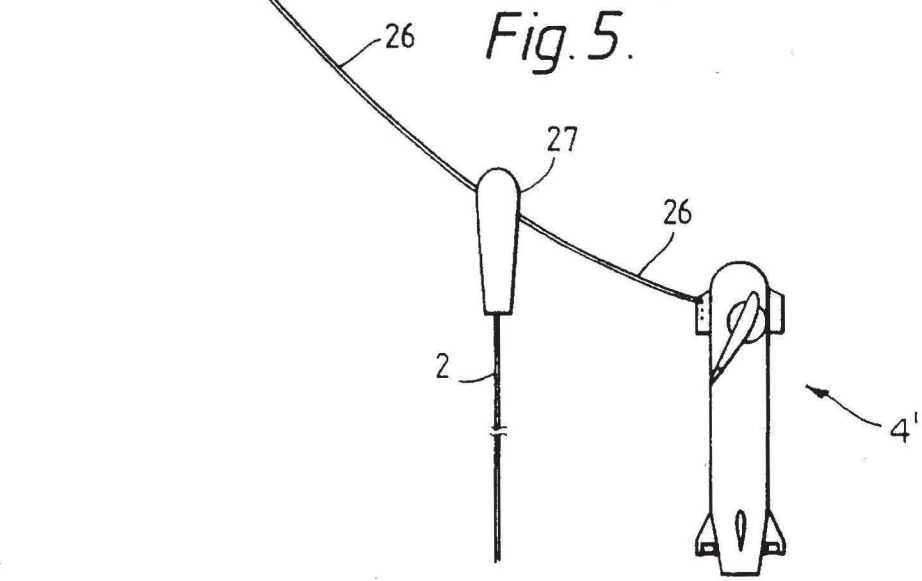


Fig. 5.



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