

Ex. PGS 1069

[54] **MODULAR AIRGUN ARRAY METHOD,
APPARATUS AND SYSTEM**

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[73] **Assignee:** Bolt Technology Corporation, Norwalk, Conn.

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[22] **Filed:** Mar. 15, 1983

[51] **Int. Cl.⁴** H04R 1/02; G01V 1/06

[52] **U.S. Cl.** 367/144; 181/118

[58] **Field of Search** 181/107, 111, 115, 117,
181/118, 119, 120; 367/56, 143, 144, 153, 154,
177, 172

[56] **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|-----------|---------|-------------------|----------|
| 3,249,177 | 5/1966 | Chelminski | 181/118 |
| 3,379,273 | 4/1968 | Chelminski | 181/118 |
| 3,653,460 | 4/1972 | Chelminski | 181/120 |
| 4,034,827 | 7/1977 | Leerskov et al. | 181/107 |
| 4,038,630 | 7/1977 | Chelminski | 181/110 |
| 4,047,591 | 9/1977 | Ward et al. | 181/107 |
| 4,072,923 | 2/1978 | Seims et al. | 367/6 |
| 4,210,222 | 7/1980 | Chelminski et al. | 181/107 |
| 4,234,052 | 11/1980 | Chelminski | 181/111 |
| 4,240,518 | 12/1980 | Chelminski | 181/107 |
| 4,286,687 | 9/1981 | Fiske, Jr. | 181/119 |
| 4,301,887 | 11/1981 | Fiske, Jr. | 181/107 |
| 4,464,739 | 8/1984 | Moorcraft | 367/20 X |

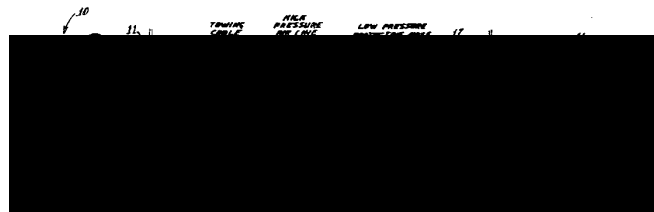
Primary Examiner—Charles T. Jordan
Assistant Examiner—Brian Scott Steinberger

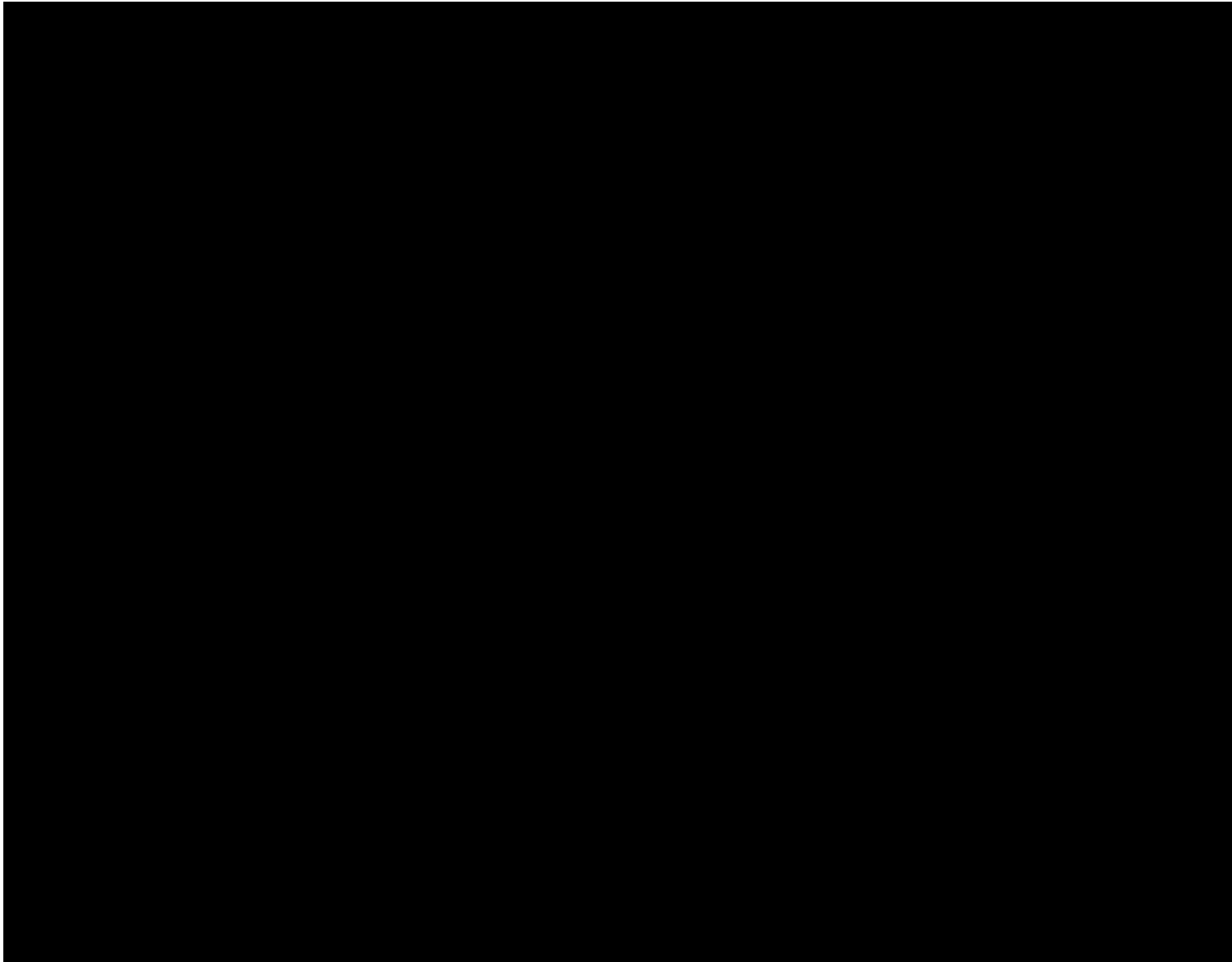
Attorney, Agent, or Firm—Parmelee, Bollinger & Bramblett

[57] **ABSTRACT**

A plurality of control station, watertight, submerged junction boxes are towed at spaced positions located along an airgun array, each junction box for including a microprocessor and data storage transmission capability, and airgun firing circuits to control predetermined airguns. The electrical cable for the array and the air supply lines, as well as the airguns to be controlled, are detachably coupled to respective junction boxes. Thus, the number of airguns in the towed array can be changed quickly and conveniently by coupling or uncoupling junction boxes and the associated airguns. A protective hose sheath extends between successive junction boxes and this hose sheath contains power lines and a communication bus, detachably connected to terminals in successive junction boxes. This hose sheath and interiors of junction boxes are pressurized with low pressure air during towing for excluding water in the event of a leak. When this array is on shipboard in sunshine the junction boxes are cooled by increasing pressure of low pressure air until a relief valve at the far end of the array opens establishing continuous flow of low pressure air travelling in series through protective hose sheath sections and through the junction boxes. The hose sheath and high pressure air supply line are each assembled in detachable sections extending between successive junction boxes. There is a short by-pass pipe for high pressure air attached to each junction box, and each airgun feed line is tapped into a respective one of these by-pass pipes.

18 Claims, 14 Drawing Figures





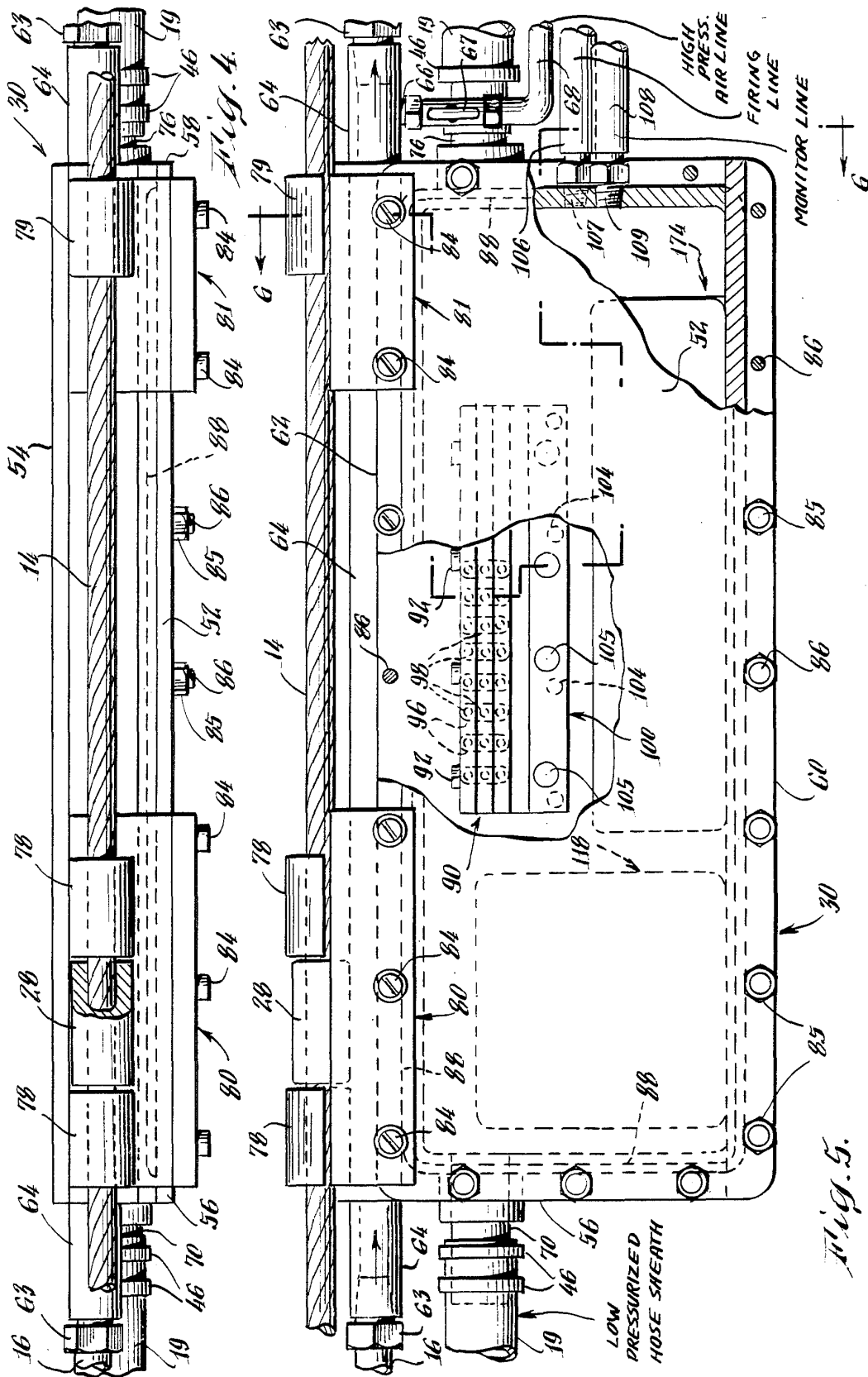
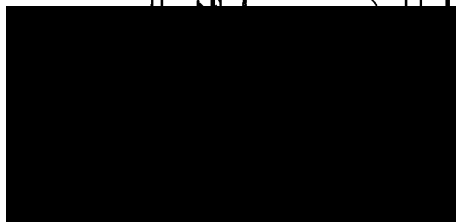


Fig. 4.

Fig. 5.



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