sensor **76** terminates sample intake in chamber **39** through two-cycle timer **57** and solenoid valve control **58** which actuates pressure control valve **91** to remove negative pressure port **88** from communication with chamber **39.**

In the event intake **19** is clogged or the flow channel **13** is dry, sample chamber **39** may not contain sufficient sample volume to bring the upper surface of the sample in contact with fill level sensor **76** within 30 seconds. In such a case, two-cycle timer **57** begins its second cycle by initiating a signal which results in actuation of pressure control valve **91** to provide positive pressure to chamber **39** for purging for fifteen seconds. Subsequently negative pressure is reintroduced into chamber **39** as before for drawing a sample into chamber **39.**

Since there is a chance that some sample remained in chamber **39** below the end of pipe **73** at the end of the second purge cycle, there is a possibility that the sample chamber will be filled to contact the fill level sensors **76** during the second intake cycle, which will then terminate the fill of chamber **39** as described above. When either fill level sensor **76** is contacted or 30 seconds have passed after the second cycle in this phase of the sampling sequence, a signal is provided to the fill and measurement timer **59** with or without a full sample chamber **39.** Pressure control valve **91** is actuated to place positive pressure port **87** in communication with chamber **39** for a period of 7 seconds which purges chamber **39** through pipe **73** and intake **19** until the surface of the sample is at the level of the lower end of pipe **73.** The predetermined sample volume is now contained in sample chamber **39.** Timer **59** signals sample valve control **61** to actuate sample control valve **96** to the open position which allows the predetermined sample volume to flow through sample outlet tube **93** to the sealed rotary union **94** and fill arm **99** to be deposited through the top openings **44** in storage containers **43** as determined by the selections made at switches **106** and **104** described above. Fifteen seconds is allowed for filling the sample containers **43** after which a signal is provided to the final purge timer **62** which begins a 5-second timing cycle. Positive pressure is again directed through pressure control valve **91** to chamber **39** for the final purge period in which intake **19** and tube **22** are cleared. Sample chamber **39** has been emptied during the previous 15 second period of time during which sample control valve **96** is open. At the end of the 5-second final purge, two-cycle timer **57** is reset by a signal from final purge timer **62.** The output of final purge control timer **62** is also directed to the multiplecontainer multiplexing circuit **64** and the multiple sample multiplexing and fill arm advance circuit **63** for depositing a single sample in a preselected number of storage containers **43** or for depositing a preselected number of samples in a single storage container **43,** as selected by switches **104** and **106** respectively. Fill arm advance circuit **63** produces a pulse which is counted in fill arm step count circuit **67** and which is also connected to fill arm step control circuit **66** for energizing stepping motor **97** to advance fill arm **99** to overlie the adjacent storage container **43.** The advance of fill arm **99** is the ultimate step in a single sampling sequence.

A ball check valve **82** as seen in FIG. **4** is provided immediately below the top cover **74** to protect the pressure line **92,** pressure control valve **91** and compressor **86.** Should the fill level sensor **76** fail to function as designed and terminate the negative pressure in chamber **39,** the chamber would continue to fill until the fluid sample was drawn through passage **81** and inlet pressure tube **77** into pressure line **92.** To prevent this,ball check valve **82** is provided to rise with the upper surface of the sample and to seat when the fill level rises to a point near top cover **74** to block the negative pressure and terminate filling of sample chamber **39.**

The next signal generated by flow meter **24** indicating that the next preselected increment of flow has passed through channel **13,** initiates another sampling sequence as described above. Each sampling sequence is recorded in the fill arm step count circuit **67** until a predetermined number of advance steps have been taken by fill arm **99.** In one embodiment of the disclosed invention, 24 storage containers **44** are provided and fill arm step count circuit **67** produces an output which is connected to power switch **54** after 24 such steps have been recorded. Power switch **54** is inhibited by the output from circuit **67** blocking further sampler sequencing so that no more samples may be taken until the sampling unit is attended by an operator. This prevents undesired sample dilution which would occur if fill arm **99** were allowed to traverse 360° or more.

The sampling sequence described above may have a time base as opposed to a flow quantity base by selecting mode switch **53** to the "time" position. In the time mode, switch **108** is positioned to select the time periods at the ends of which the sampling sequence will be initiated. In the present embodiment, time intervals ranging from one-quarter hour to 24 hours are selectable. Clock **51,** seen in schematic detail in FIG. **5,** includes a crystal oscillator X1 for providing a frequency output which is divided to produce a pulse at predetermined periods of time. The time interval for the pulse is selected at switch **108,** which then delivers the pulse as the appropriate input signal to initiate the sampling sequence for collecting flow samples at the selected intervals of time. The remaining operation when in the time mode is similar to that described for the flow mode above.

A block diagram of another embodiment of the disclosed invention is shown in FIG. **12.** The difference between the embodiment of FIG. **12** and that of FIG. **3** is partially due to the fact that the sampler described therein has only a single storage container **166** as seen in FIG. **13.** For this reason, the diagram of FIG. **12** does not have a multiple sample and fill arm advance circuit **63,** a fill arm step count circuit **67,** a multiple container multiplex circuit **64,** or a fill arm step control circuit **66.** The remainder of FIG. **12** is similar to FIG. **3** and like elements are assigned the same item numbers.

Referring to FIG. **13,** sample chamber assembly **39** is shown having vertically adjustable pipe **73** connected to the adapter **48** on tube **22.** A probe **167,** or plurality of probes **167,** is positioned to extend into the interior of chamber **39.** Probe **167** carries a sensing element which is connected to a sensing control circuit **168** which provides an output connected to a recorder **169.** Compressor **86** has positive and negative pressure outlet ports **87** and **88** respectively which are directed to pressure control valve **91** and subsequently to the interior of chamber **39** through additional pressure line **92.** Controlmodule **101** is connected through conductors **102** to compressor **86,** pressure control valve **91,** sample control valve **96,** and fill level probe **76,** as described in FIG. **4** above. Sample chamber assembly **39**