

While only one embodiment of the invention has been described in the foregoing detailed description, it is understood that many changes may be made in accordance with the knowledge of this art, all within the spirit of the invention and the scope of the appended claims.

I claim:

1. Apparatus for indicating rate of flow of a fluid comprising a weir arranged to receive said liquid thereover, a dip tube having its outlet end extended below the level of said liquid behind said weir at least to the depth of the throat of the weir, means for feeding at the other end of said tube a gas under pressure so that said gas is caused to pass in a continuous stream from the outlet end of said tube into said liquid, an electronic transducer sensitive to gas pressure when impressed thereon and which yields an output voltage proportional to said pressure, means for impressing upon said transducer the pressure of said gas which is passed through said tube, a function amplifier having a logarithmic function element set at a value of at least 1.0 and which is a constant for the shape of said weir, means connected with the output of said transducer for impressing upon said amplifier a voltage which is proportional to the output voltage of said transducer, and means connected to the output of said amplifier for indicating a value proportional to the output voltage of said amplifier.

2. Apparatus as set forth in claim 1 wherein said amplifier has also a linear function element which is set at a value which is constant for the shape of said weir.

3. Apparatus as set forth in claim 1 including a liquid sampling device actuatable upon receipt of a signal for taking a sample of said liquid, and means connected with the output of said function amplifier for delivering said signal to said sampling device when a predetermined charge has been received from said function amplifier.

4. Apparatus as set forth in claim 3 wherein said indicating means is responsive to said signal and is effective for indicating when said sampling device is operated to take a sample of liquid.

5. Apparatus as set forth in claim 4 wherein said means for delivering a signal includes a switch device, and means responsive to the operation of said switch for actuating said indicating means to indicate the taking of a sample of liquid.

6. Apparatus as set forth in claim 3 wherein said last mentioned means has an adjustable element for varying said charge.

7. Apparatus as set forth in claim 1 including a differential amplifier connected between said transducer and said function amplifier, said differential amplifier being biased to produce zero voltage when the level of said liquid is at the throat of said weir.

8. Apparatus as set forth in claim 1 wherein said indicating means is a recorder and capable of making a continuing record of the values proportional to the output of said function amplifier over a predetermined period.

9. Apparatus as set forth in claim 8 wherein said recorder has a record sheet which is calibrated to indicate unit volume of liquid flow during a unit period.

10. A method for making a record of the rate of flow of a flowing liquid comprising passing said liquid over a weir, discharging a gas in a constantly flowing steam

into said liquid behind said weir at a point at least as low as the throat of said weir, and impressing the pressure of said gas on an electronic transducer which is sensitive to such pressure for converting the value of said pressure to an electrical potential, amplifying said potential by a logarithmic factor which is at least 1.0 and corresponds with the shape of said weir, and recording said amplified potential to produce a record indicating the rate of flow of said liquid over a time period.

11. Apparatus as set forth in claim 3 in which said last mentioned means includes a condenser of the type which discharges when its charge reaches a predetermined value, and in which said signal is given upon the discharge of said condenser.

12. Apparatus as set forth in claim 5 in which said signal delivering means includes a condenser and in which said switch and said sampling device are each actuated by discharge of said condenser.

13. In a device for recording the rate of flow in a liquid stream and for taking samples of the liquid, means sensitive to rate of flow of said liquid for producing an electrical signal which is proportional to said rate, recorder means sensitive to said signal for recording the value of said rate over a period of time, said recorder means having a circuit by which it is energized and being operable when said circuit is closed, means sensitive to the energy of said signal over a time period for taking a sample of said liquid and means for interrupting said recorder circuit when a sample is taken whereby to indicate on the record made by said recorder the time when a sample is taken.

14. A device as set forth in claim 13 in which said interrupting means includes a switch in said recorder circuit and means for operating said switch to open said circuit when a sample is taken.

15. A device as set forth in claim 14 in which said means for taking a sample includes a solenoid which is energized when a sample is taken and wherein said solenoid when energized operates said switch to open said recorder circuit.

16. A device as set forth in claim 14 wherein said switch is spring biased toward closing of said circuit and wherein said means for operating said switch is momentarily operable upon the taking of a sample and after operation relaxes to allow said spring-biased switch to again close said recorder circuit.

17. A method for monitoring a flowing liquid comprising passing said liquid over a weir, discharging a gas in a constantly flowing stream into said liquid behind the weir at a point at least as low as the throat of said weir, impressing the pressure of said gas on an electric transducer which is sensitive to such pressure for converting the value of said pressure to an electrical potential which is proportional to the height of said liquid, amplifying said potential, and when said amplified potential is obtained for a time sufficient to produce an electric charge of a predetermined amount taking a sample of said liquid and recording the time at which the sample is taken.

18. The method of claim 17 including the step of recording during a predetermined period and on the same record the value of said voltage and the time when said sample is taken.

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