

- [54] **MASS FLOW METER AND SIGNAL PROCESSING SYSTEM**
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- [73] **Assignee:** Smith Meter Inc., Erie, Pa.
- [21] **Appl. No.:** 797,980
- [22] **Filed:** Nov. 14, 1985

Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 742,567, Jun. 7, 1985, abandoned.
- [51] **Int. Cl.⁴** **G01F 1/84**
- [52] **U.S. Cl.** **73/861.38**
- [58] **Field of Search** **73/861.27, 861.28, 861.38**

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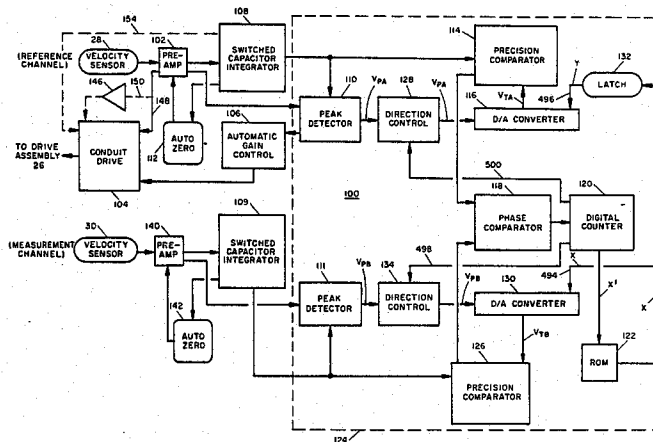
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Attorney, Agent, or Firm—Andrew J. Cornelius

[57] **ABSTRACT**

A signal processing system that directly determines the phase difference existing between two periodic electrical signals and a mass flow meter employing the system are provided. The system shifts together two comparison signals corresponding to the periodic electrical signals and accumulates the shift that is necessary to force the phase angles of the comparison signals to be equal. The mass flow meter employs a moving conduit through which the fluid whose mass flow rate is to be measured flows and which generates Coriolis forces. The Coriolis forces affect the motion of the moving conduit and motion sensors provide periodic signals corresponding to the motion of the conduit. Under flow conditions, the Coriolis forces cause the electrical signals produced by the sensors to be out of phase with each other to an extent that depends on the magnitude of the mass flow rate. The system provided by the invention is employed by the meter to measure the phase difference between the electrical signals to provide an indication of the mass flow rate through the moving conduit.

7 Claims, 32 Drawing Figures



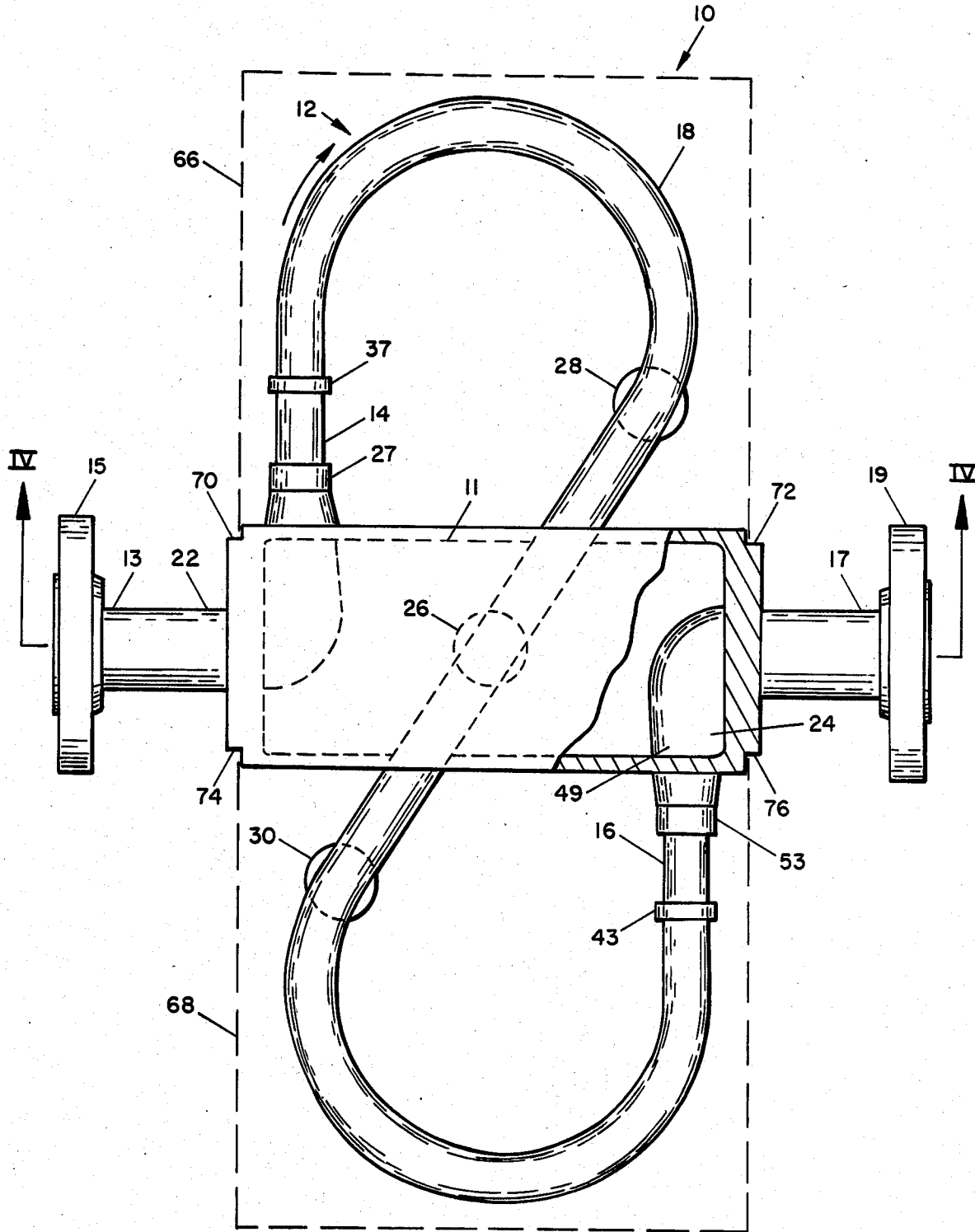


FIG. 1

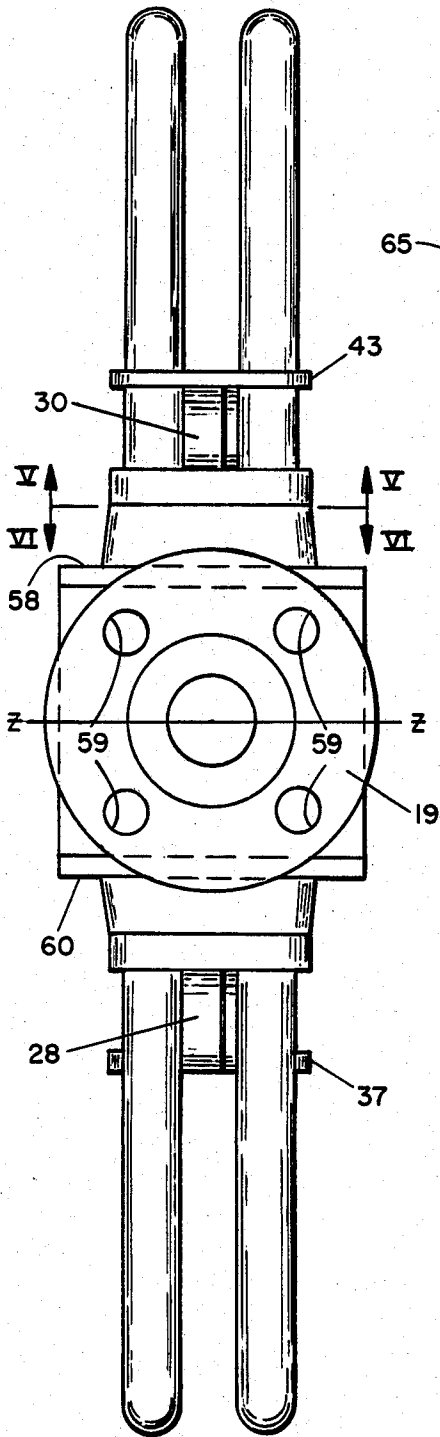


FIG. 2

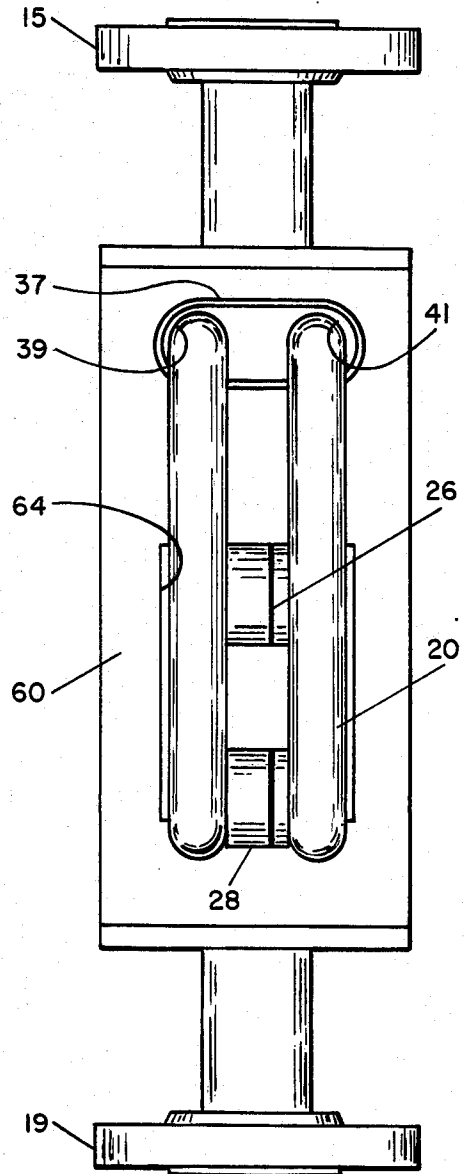
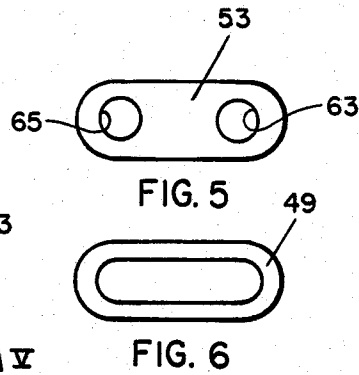


FIG. 3

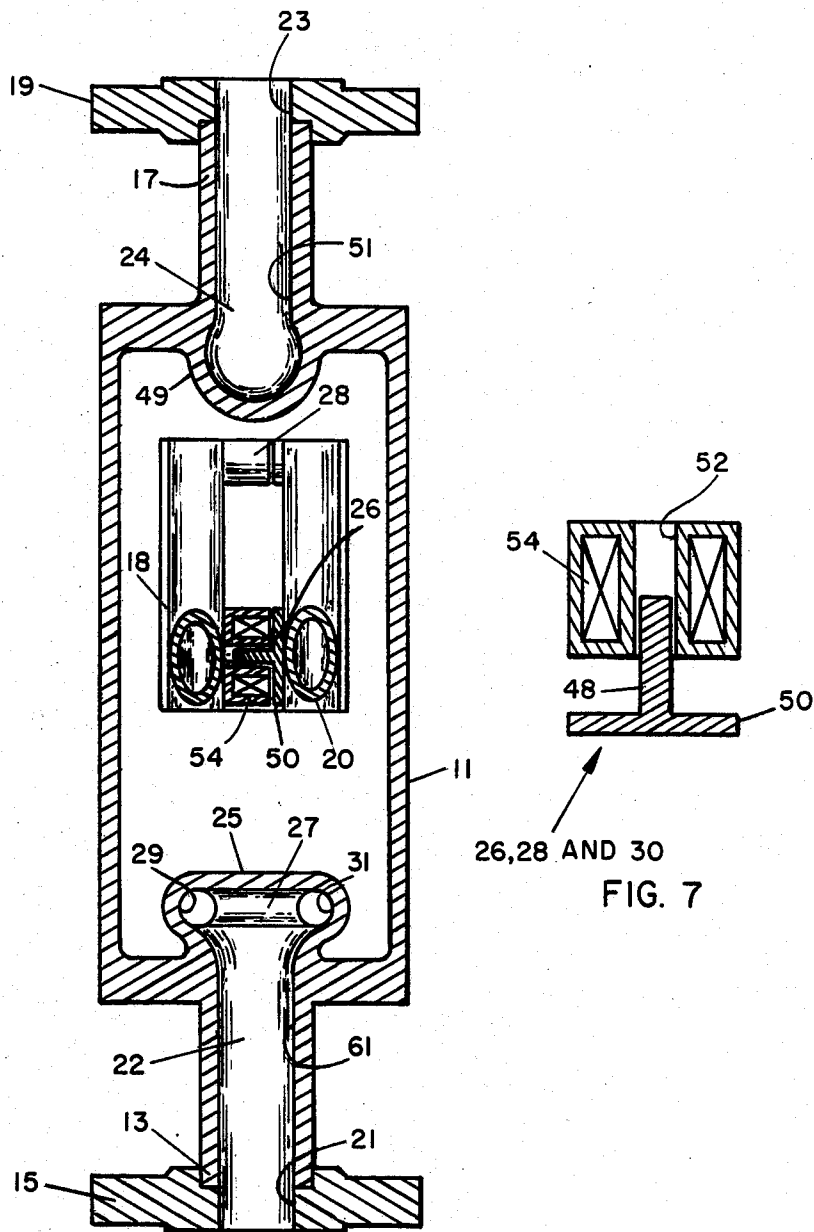


FIG. 4

26, 28 AND 30
FIG. 7

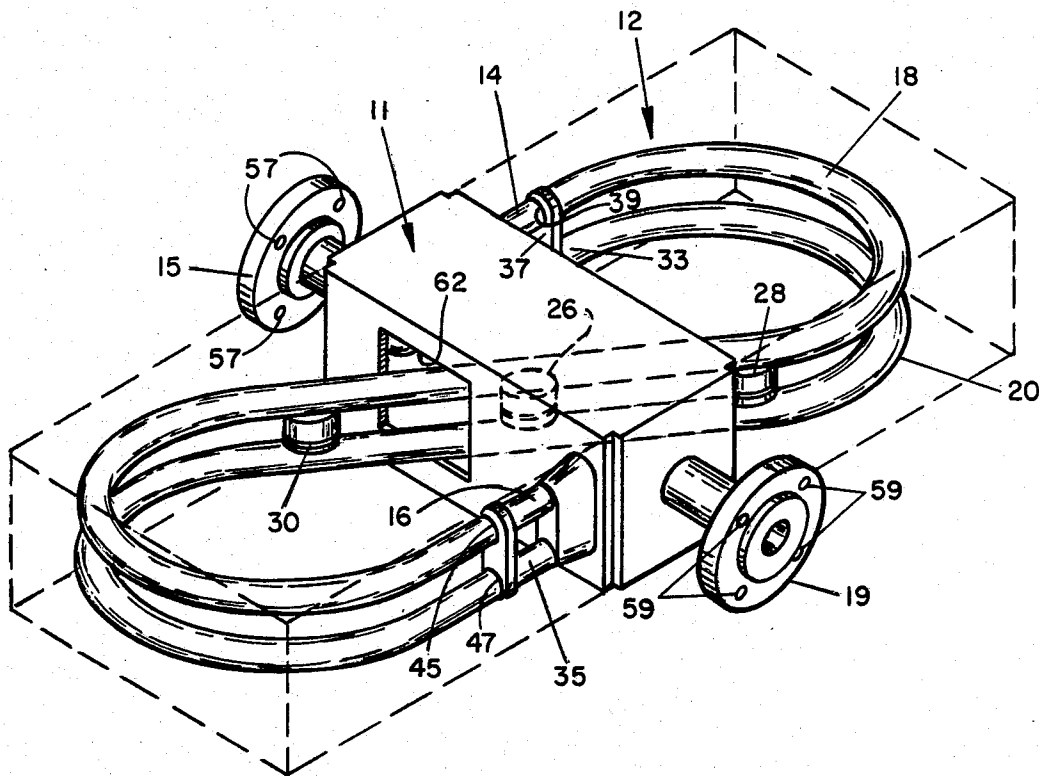


FIG. 8

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