United States Patent [19]

Kalotay

[54] **CORIOLIS EFFECT METER USING OPTICAL FIBER SENSORS**

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[52] U.S. Cl. 73/861.38; 73/657
[58] Field of Search .... 73/861.37, 861.38, 32 A, 73/653, 655, 657

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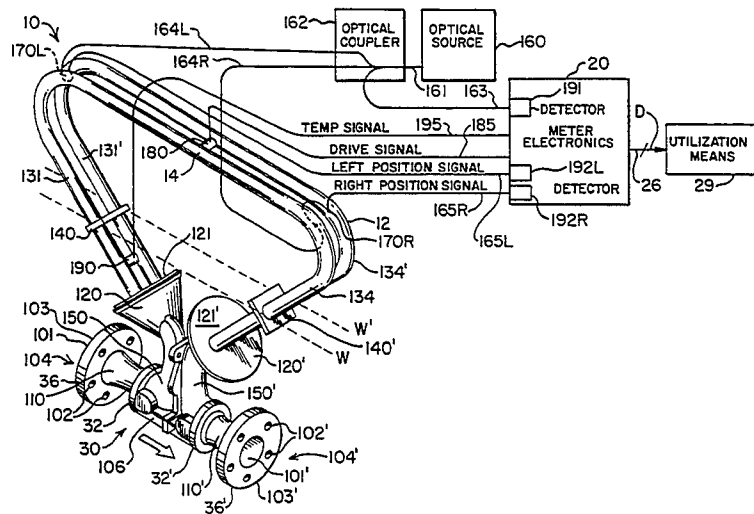|			
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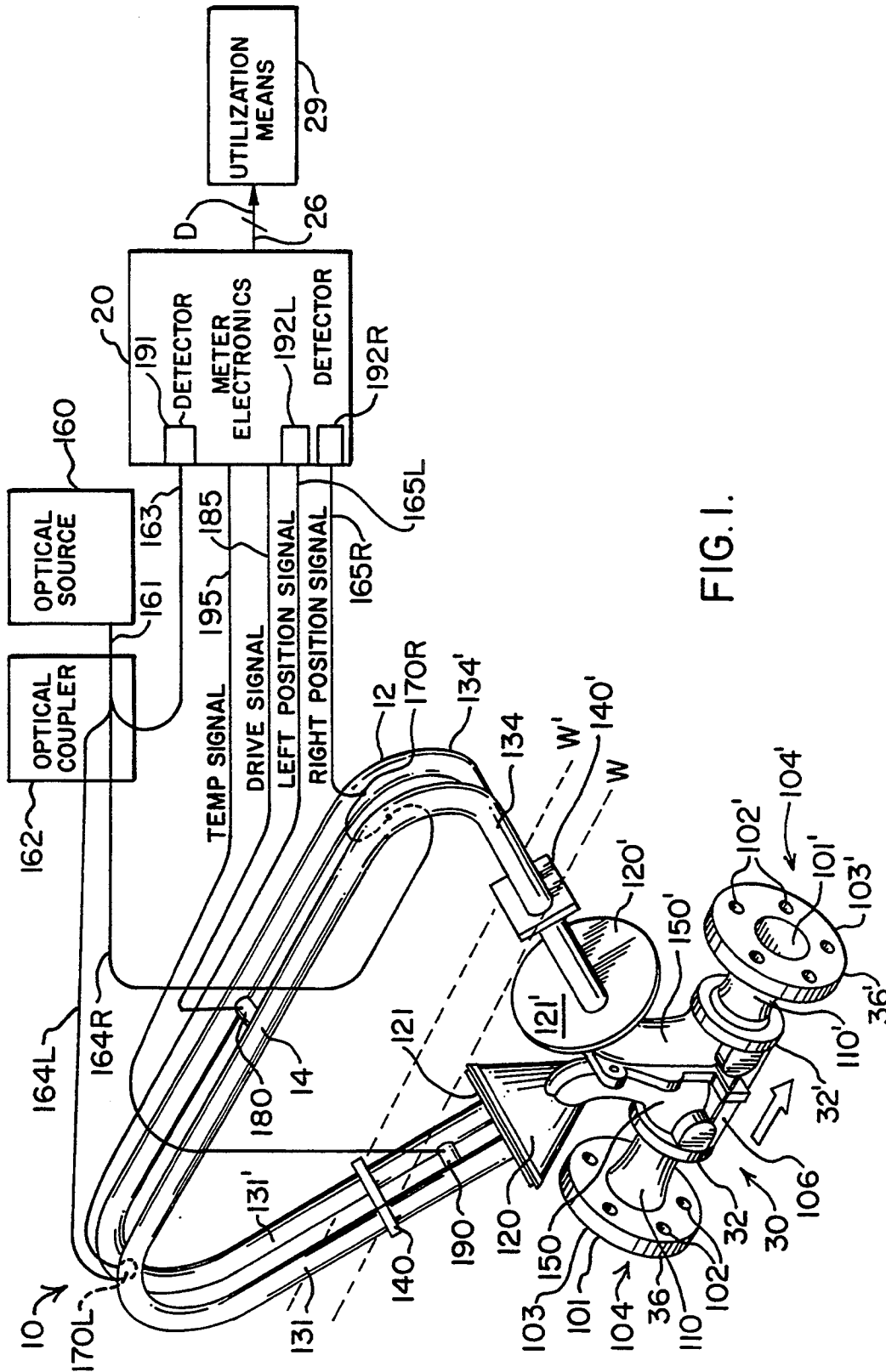Stewart D. Personick; "Fiber Optics Technology and Applications"; Aug. 1985; pp. 226–227.

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Attorney, Agent, or Firm—Duft, Graziano & Forest

[57] **ABSTRACT**

A Coriolis mass flow rate meter for measuring the mass flow rate of material flowing through a conduit. The flow meter includes at least one flow tube through which the material to be measured passes. The flow tube is vibrated at its natural frequency so that the concurrent flow of material through the vibrating tube produces a displacement of the tube with the magnitude of the displacement being dependent upon the magnitude of the generated Coriolis forces and the mass flow rate of the measured material. The phase of the displacement of the flow tube is measured using optical fiber sensors comprising at least one loop of optical fiber which is flexed by the displacement of the flow tube. This flexing of the fiber causes a corresponding change in its optical conductivity and a corresponding change in the intensity of the light transmitted through the fiber from a light signal source to a signal detector. The modulated light signal received by the optical signal detector is converted to an electrical signal which is processed to generate the mass flow rate and other information for the flowing material. A feedback circuit for the light signal source monitors the average intensity of the light received by the signal detector and controls the drive signal applied to the light source to maintain the average intensity of the light signal received by the detector at a predetermined initial intensity.

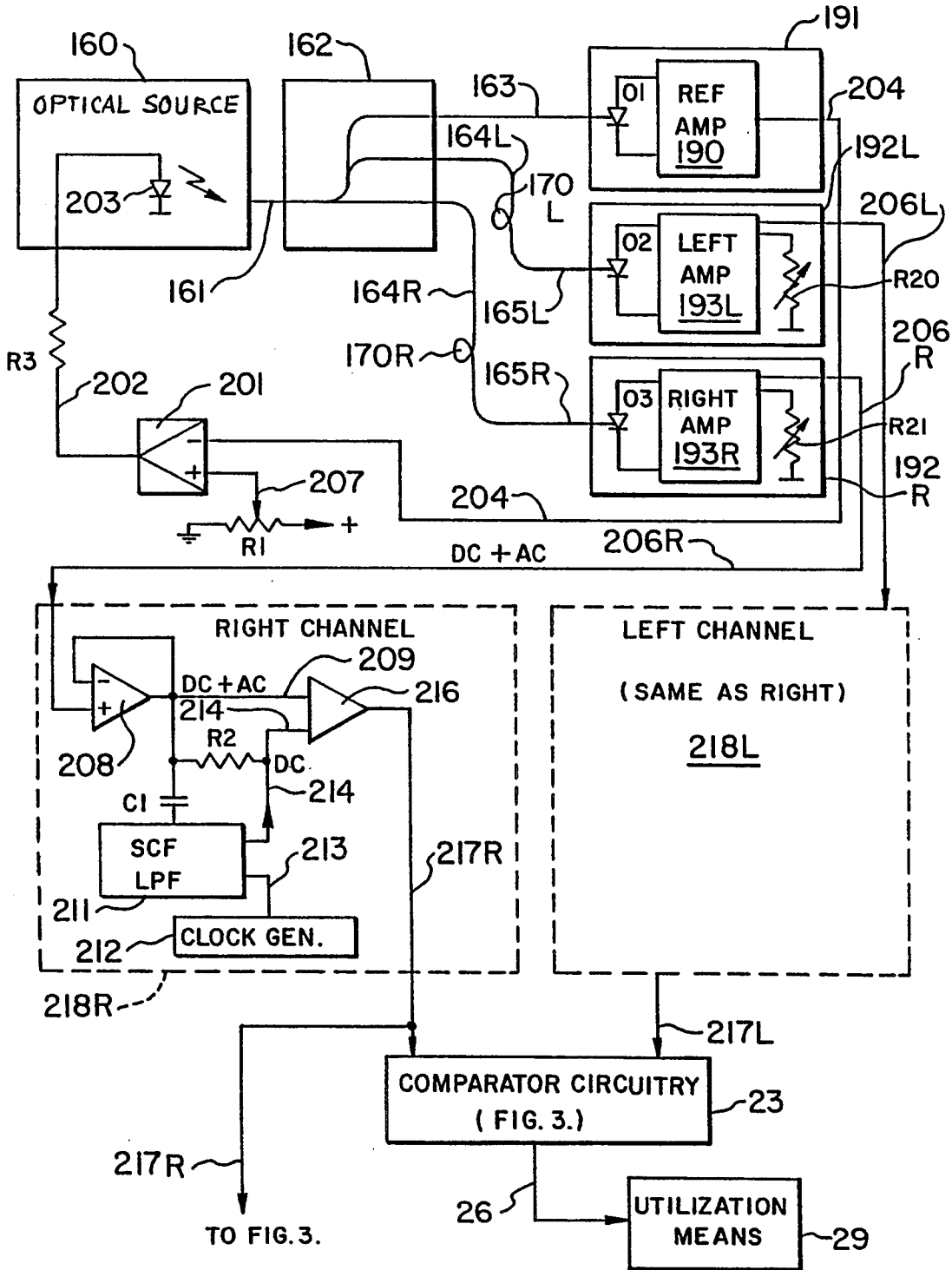**23 Claims, 5 Drawing Sheets**
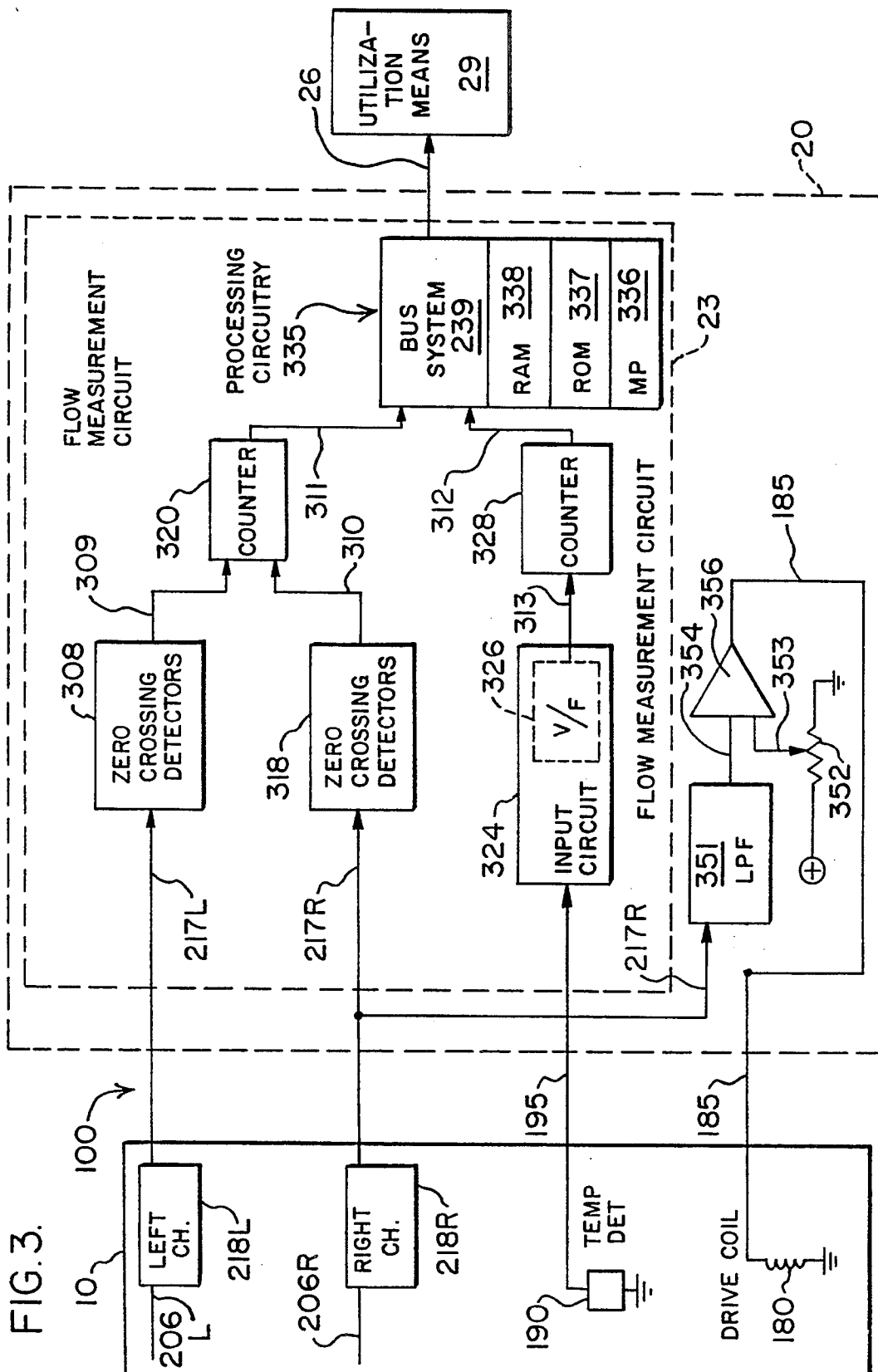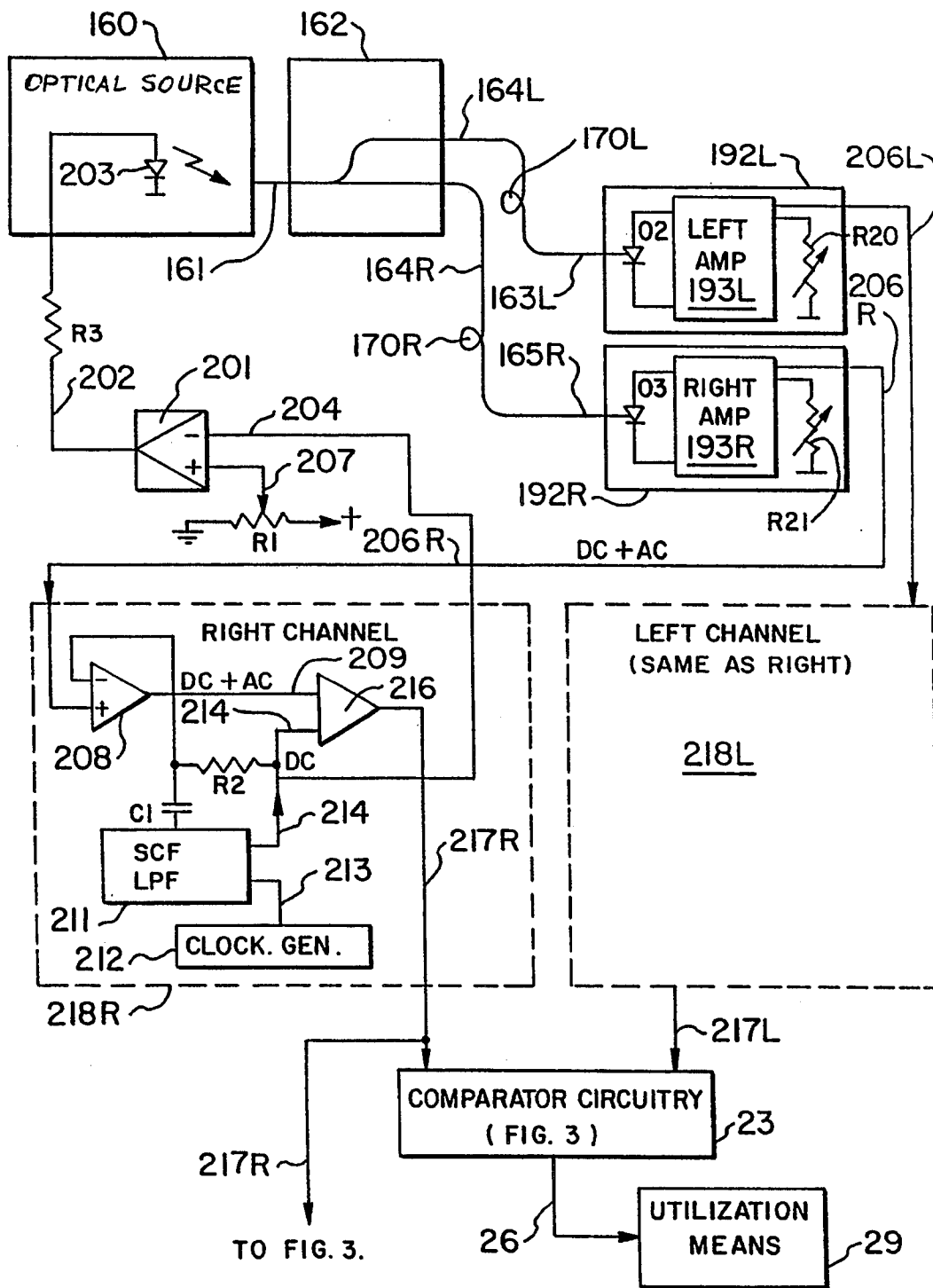
FIG. I.

FIG. 2.

FIG. 3.

FIG.4.

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