

[54] METHOD AND APPARATUS FOR MEASURING STEAM QUALITY

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[51] Int. Cl.<sup>4</sup> ..... G01N 9/36; G01K 17/06

[52] U.S. Cl. .... 374/42; 73/32 A; 73/29

[58] Field of Search ..... 73/32 A, 29, 30, 155; 374/40, 42, 118

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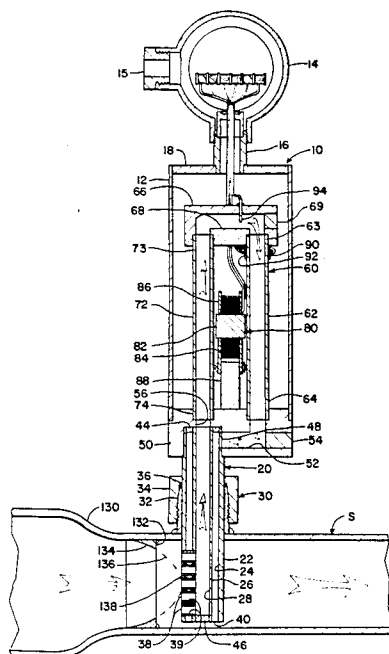
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[57] ABSTRACT

A method and apparatus for measuring steam quality of wet or two-phase flowing steam includes a flow-through densitometer comprised of two parallel tubes connected to two common nodes, a vibrator for causing the tubes to vibrate, and a transducer for detecting the frequency and amplitude of the vibrations. A temperature probe detects the temperature of the steam, and a computer is used to monitor the vibrations and temperature and to calculate steam quality. The computer can also be used to control the vibrator. An intake sampler is positioned in a flowing steam line to divert a representative sample of the wet steam into the densitometer. The bulk density of the steam is determined as a function of the fundamental frequency of the densitometer with the steam flowing therethrough, and the steam quality is determined as a function of the bulk density and vapor density, which is a function of temperature.

46 Claims, 8 Drawing Figures



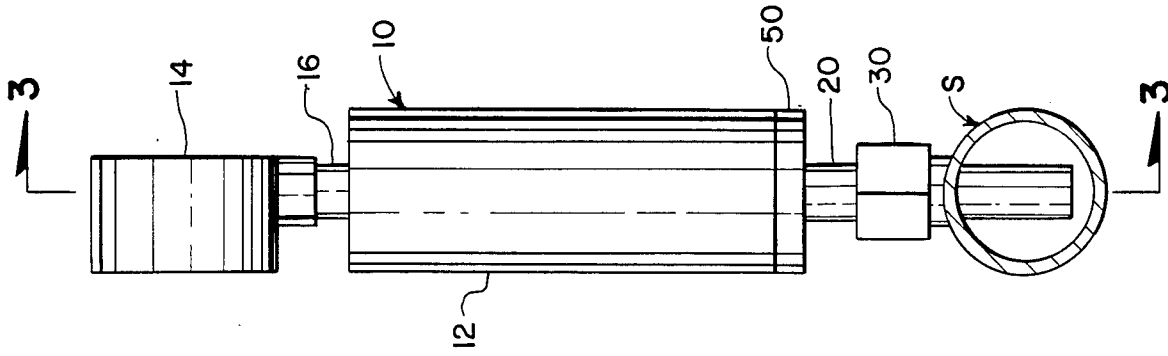


FIG. 2

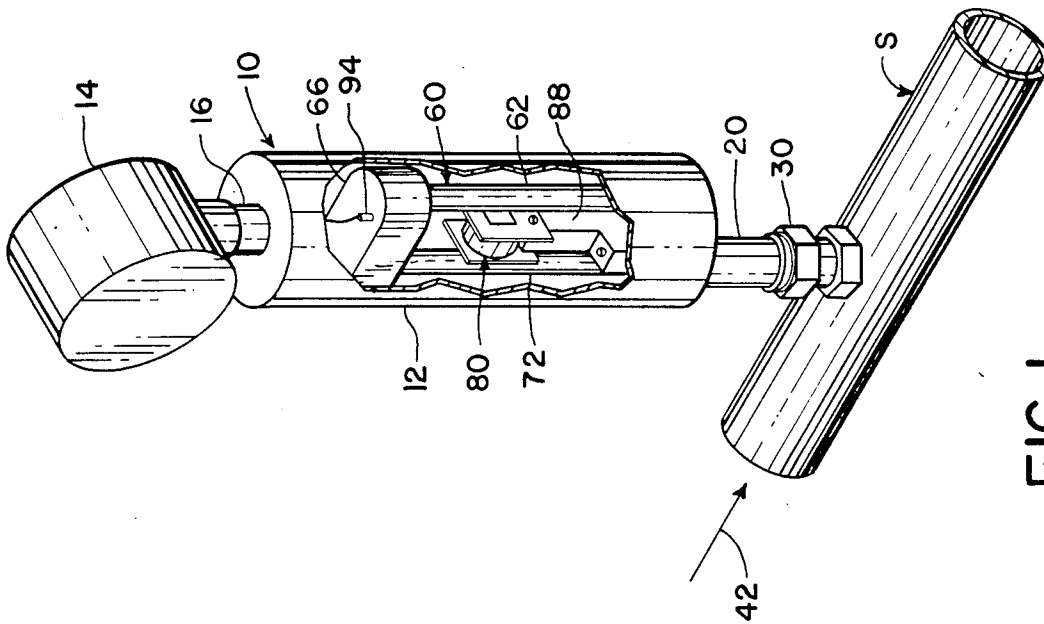
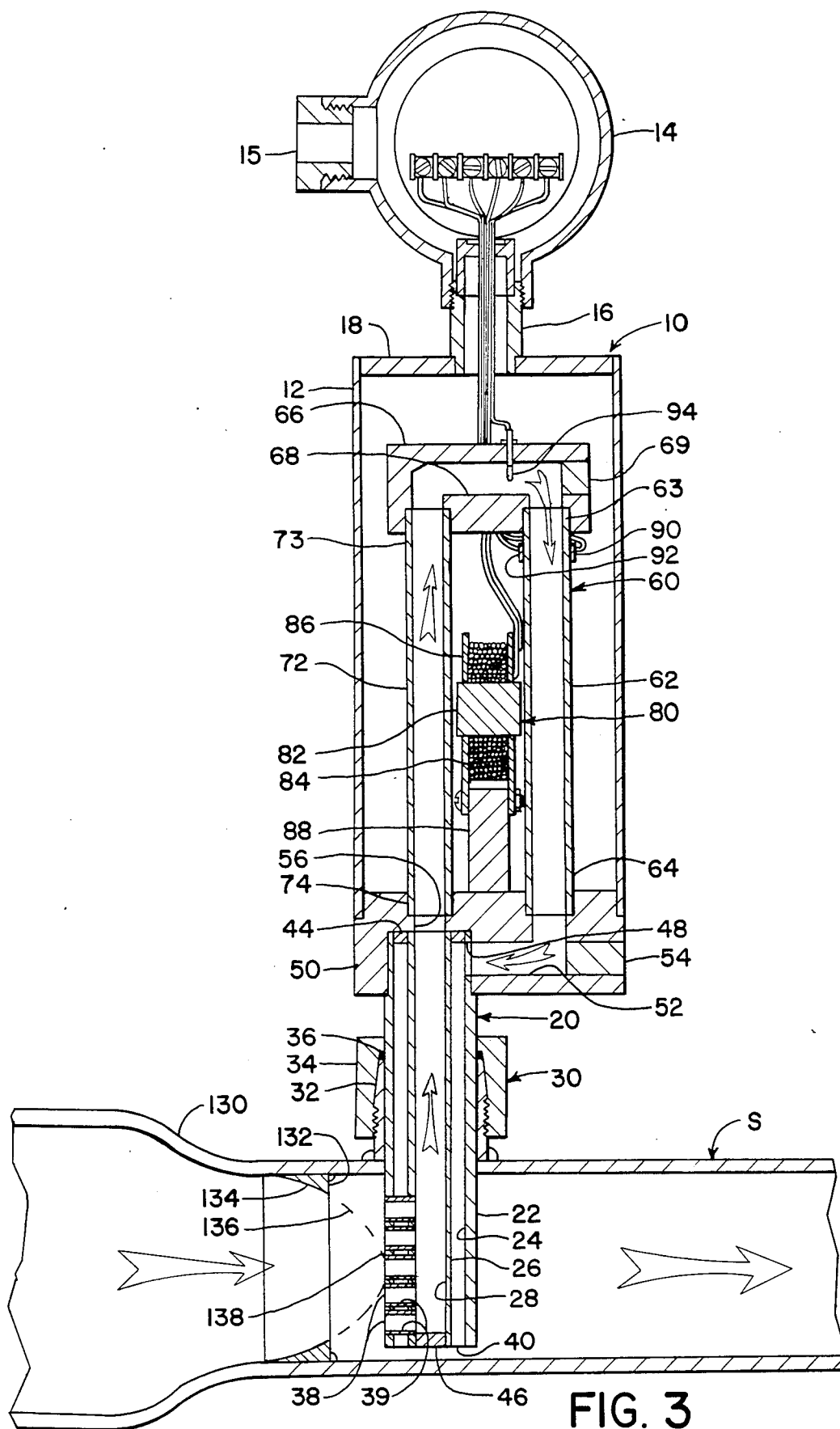


FIG. 1



**FIG. 3**

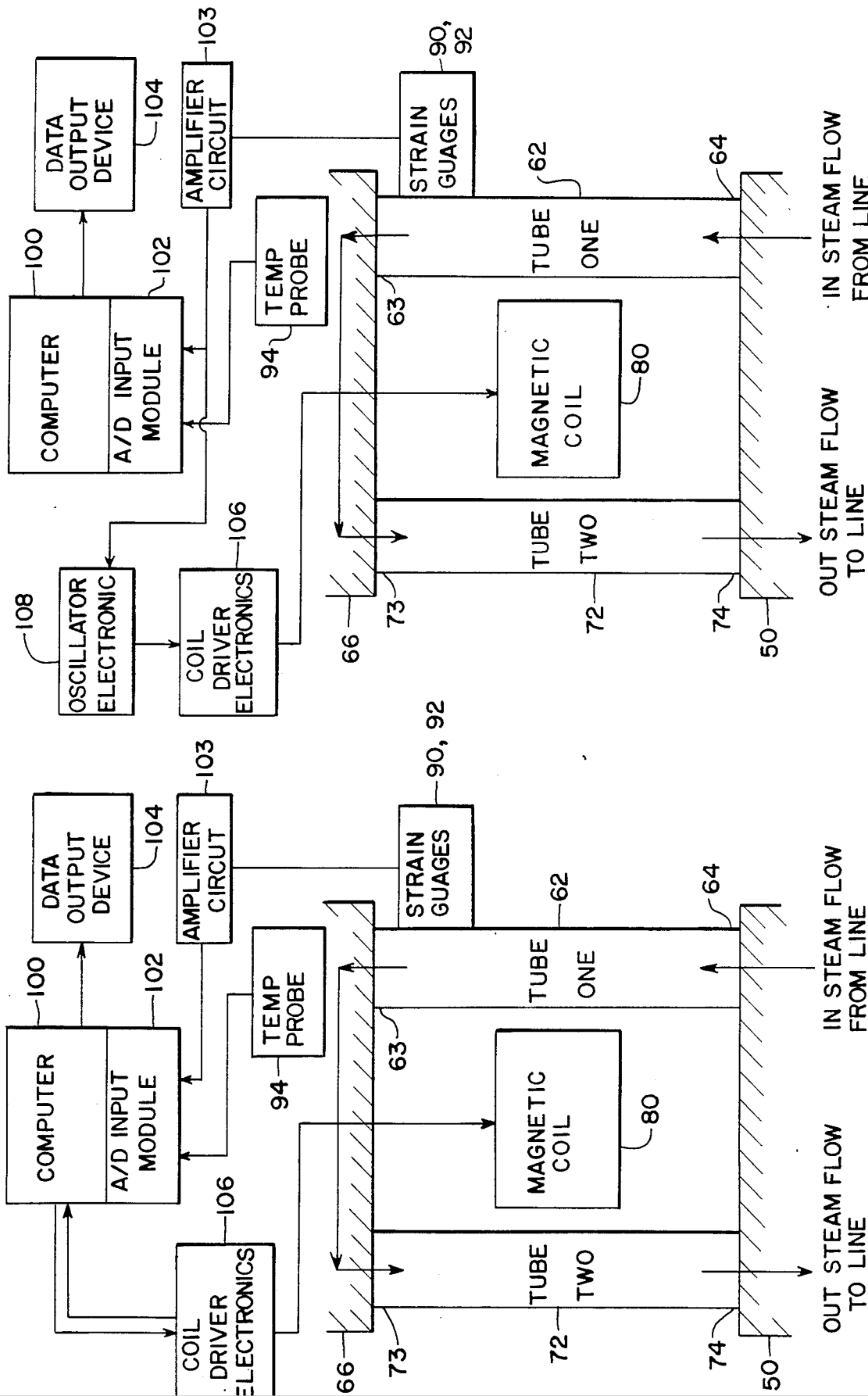


FIG. 5

FIG. 4

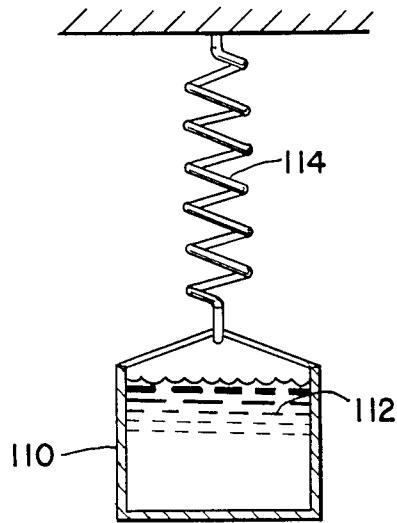


FIG. 6

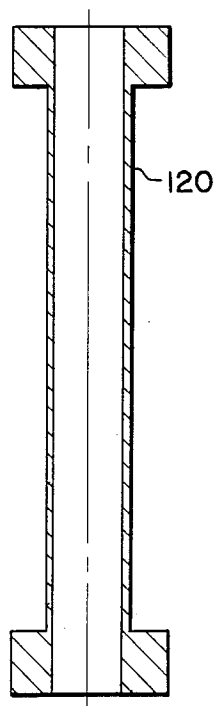


FIG. 7

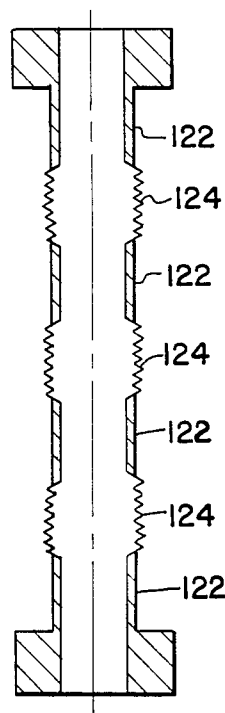


FIG. 8

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