Sensitive elements of devices and sensors

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Division of sensitive elements

Mechanical (elastic)

Electric parametric

Electric generating

Magnetic

Magnetoelectric

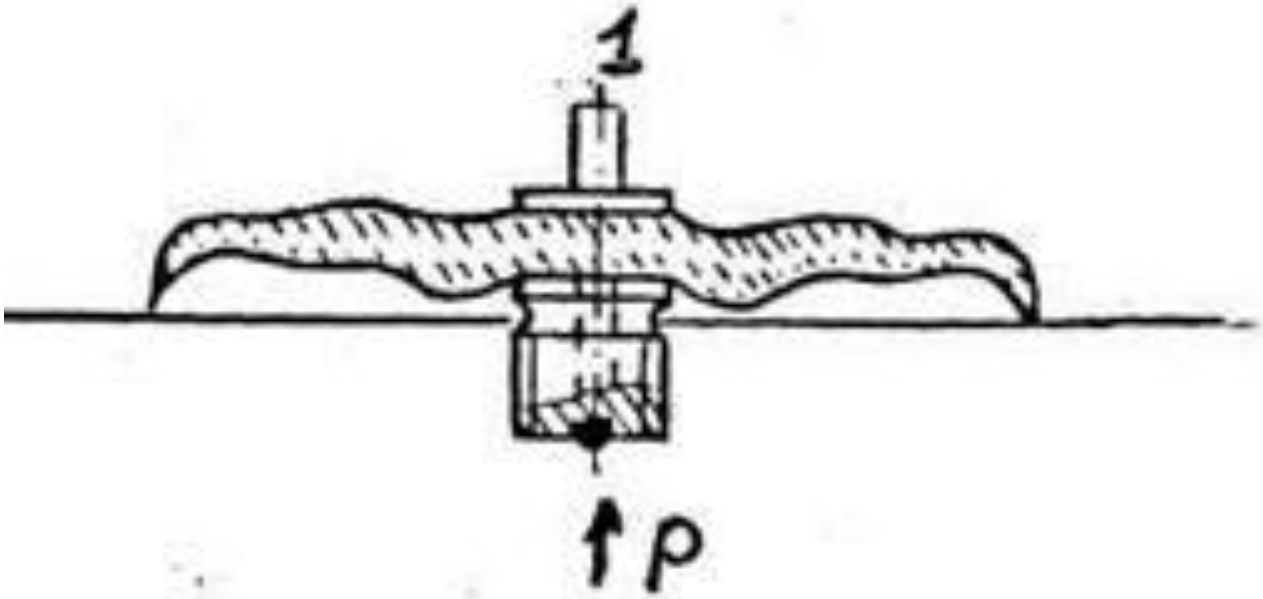
The main characteristics of sensitive elements:

- Reliability
- Microminiaturization
- Unification
- Standardization

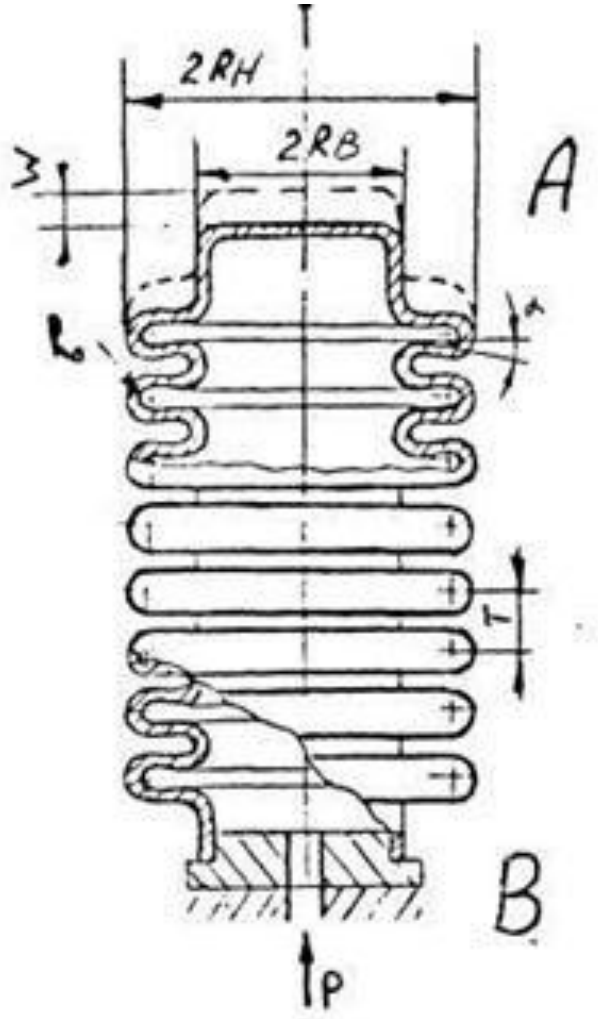
Elastic sensitive elements

- Springs
- Membranes
- Bellows
- Manometric tubes
- Thermobimetallic elements
- Impellers

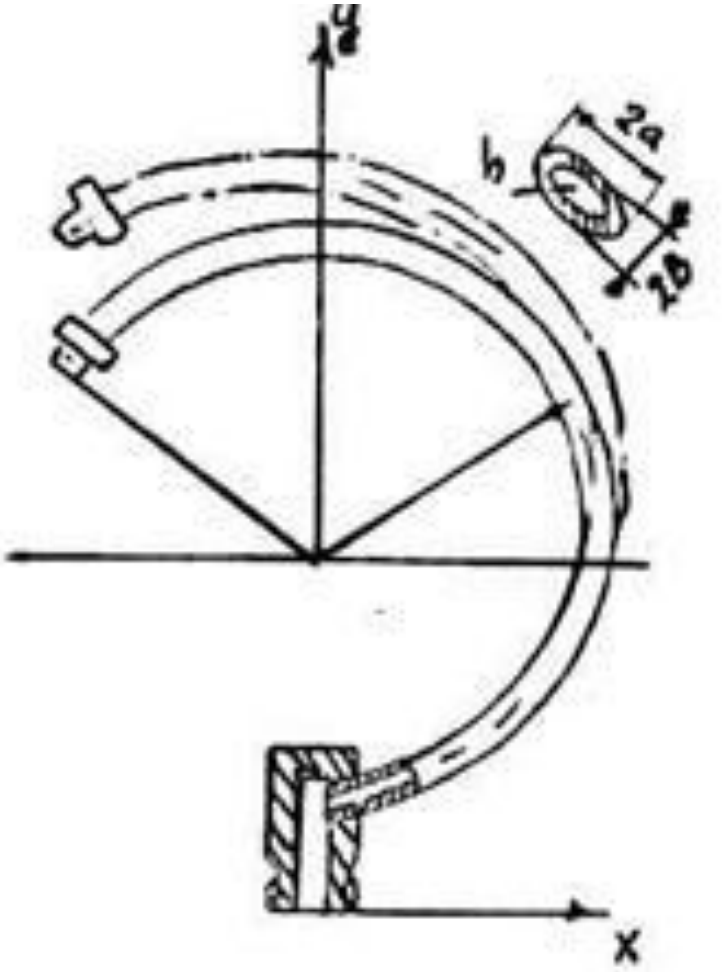
Springs



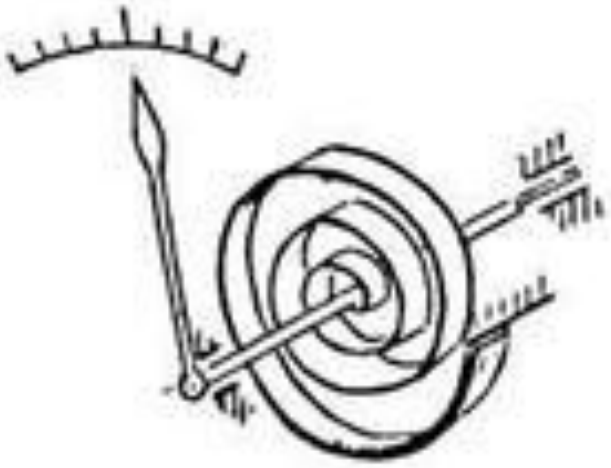
Bellow

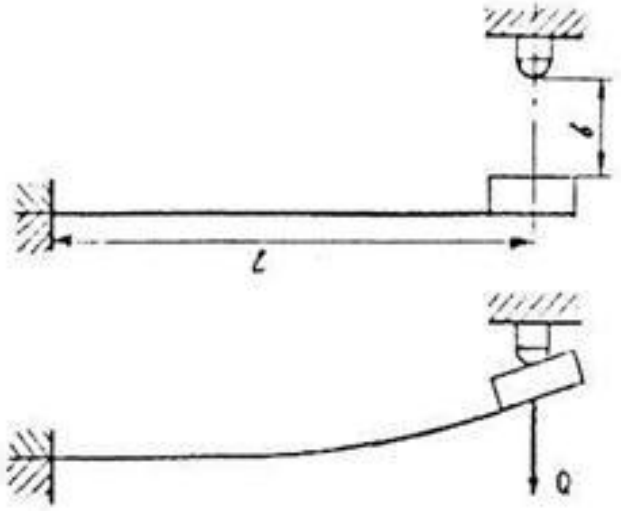


Manometric tubular plate



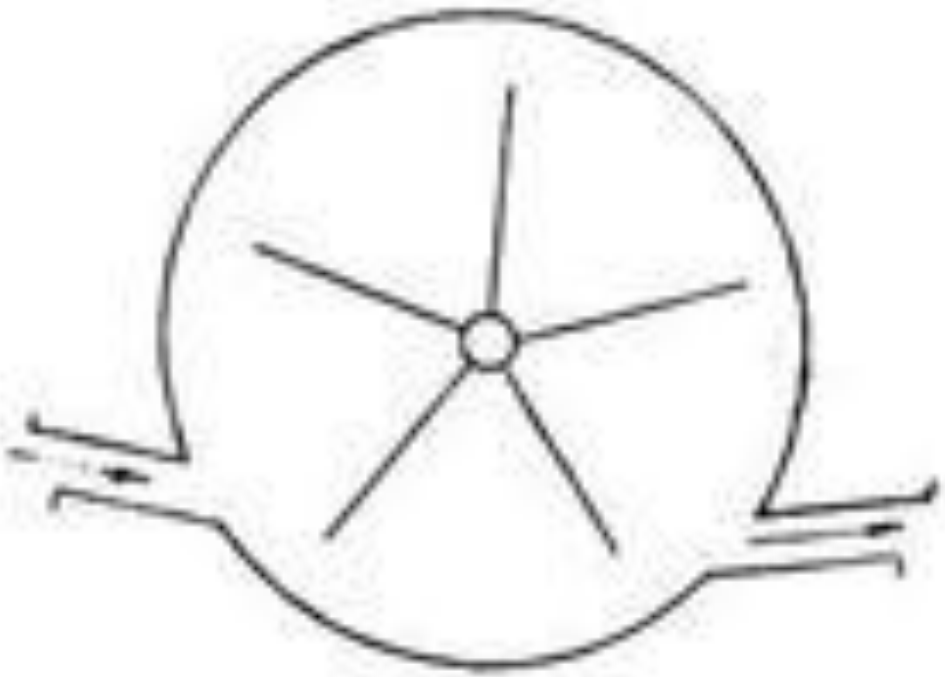
Bimetallic thermometer element





Bimetallic contact

Impeller



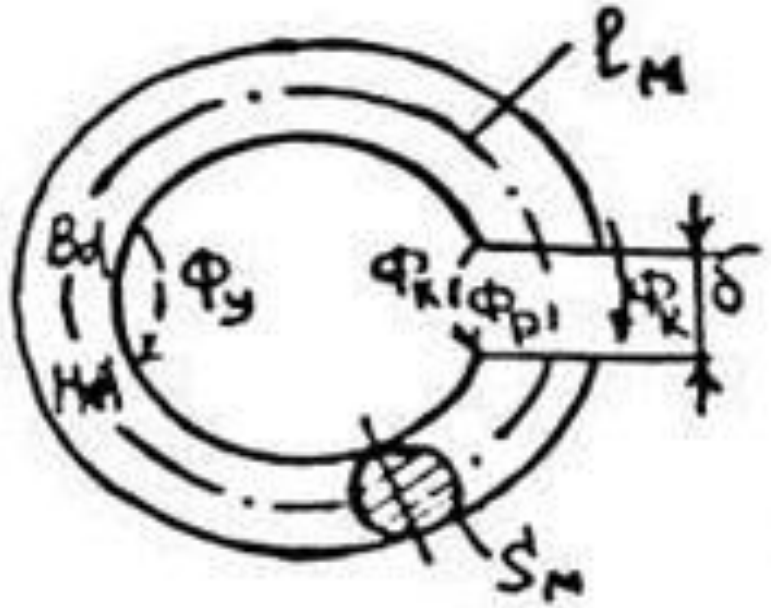
Electrical sensitive elements.

- Parametric
- Generator.

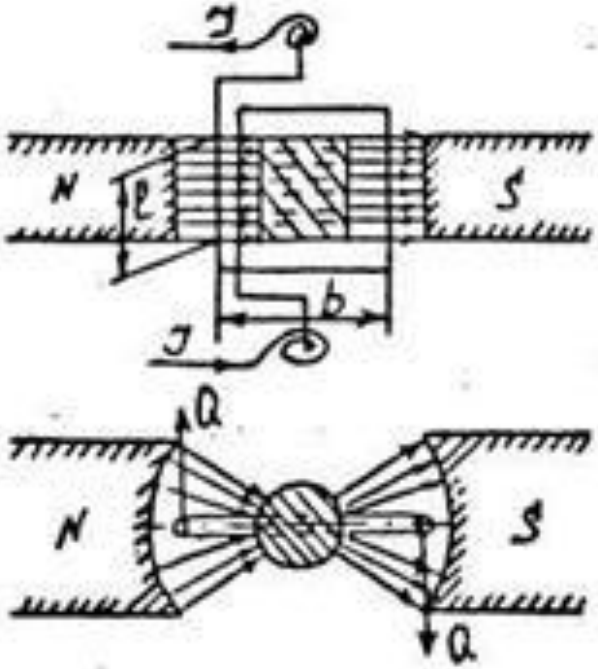
To ensure the operation of parametric elements, a power supply is required.

The generator sensitive element converts the input physical quantity into an EMF. Generator elements do not require a power supply in most cases.

Magnetic and magnetoelectric sensitive elements



Scheme of an annular permanent magnet with an air gap



Magnetoelectric sensitive elements are widely used to convert current I or voltage U into a force of Q or moment M. The most common in the nomenclature of devices are magnetoelectric galvanometers and logometers. The galvanometer (Fig. 12) consists of a fixed magnet NS and a movable frame having a width b.

Comparison with permanent magnets

Advantages of sensitive magnetoelectric elements:

- High sensitivity
- Accuracy of measurements
- Linearity of characteristics

Comparison with permanent magnets

Disadvantages of sensitive magnetoelectric elements:

- Complexity of construction
- Unsuitable for direct measurement of alternating current.

Thank you for your attention!