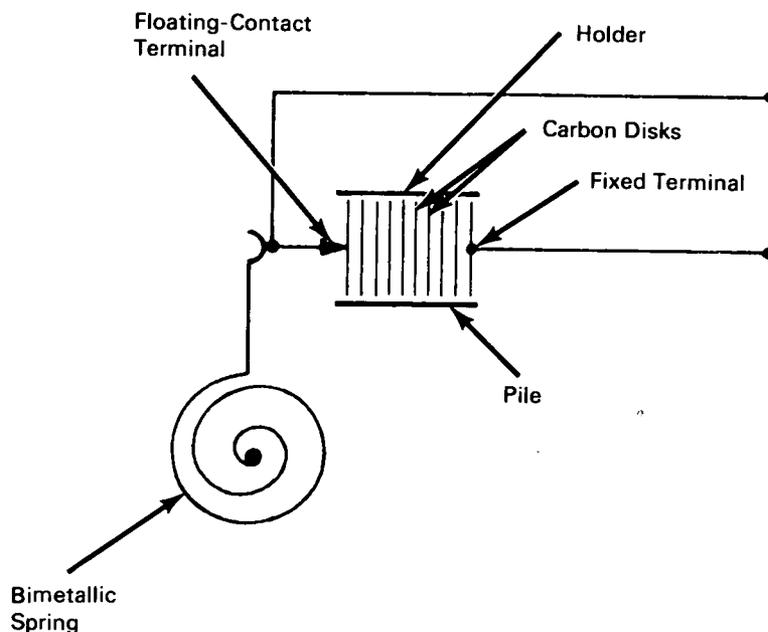


NASA TECH BRIEF



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Temperature-Controlled Resistor



Schematic

The problem:

To control thermally and directly the electrical resistance of a resistor.

The solution:

A carbon-pile resistor whose resistance is increased or decreased by compression or relaxation of a pile of carbon disks by a thermally actuated bimetallic spring.

How it's done:

One terminal is fixed at the far end of the holder of a pile of carbon disks. The other connection is a floating contact made with the disk at the near end of the pile. When the relaxed disks are in loose contact with

each other there is great resistance between the terminals. Heat generated in the resistor is applied to a bimetallic coiled spring. The heated and expanded spring applies pressure to the floating contact and so compresses the pile of disks, decreasing its resistance.

According to the sense of winding of the spring, the pressure exerted by it varies either directly or inversely with temperature. The bimetallic element need not be a coil. A hydraulic mechanism, responsive to temperature, could be used to compress the pile. The concept is advantageous in that it is direct-acting, can be arranged to cover a wide range of pre-

(continued overleaf)

determinable and controllable characteristics, and can handle considerable power directly.

Notes:

1. The concept may interest designers of temperature-control or electronic equipment, or manufacturers of chemicals or electronic components.
2. This development is in the conceptual stage only; at the time of this publication no model or prototype exists.
3. No further documentation is available. Inquiries may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: B69-10440

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

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