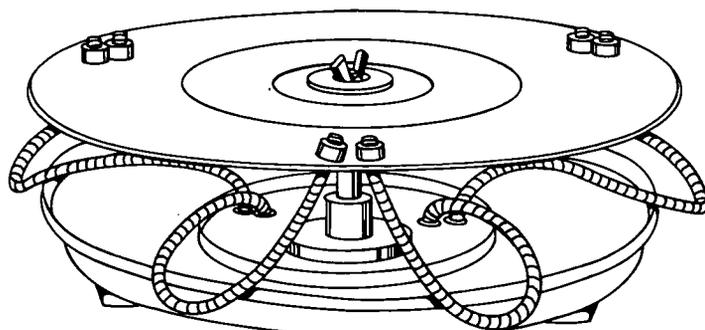


NASA TECH BRIEF

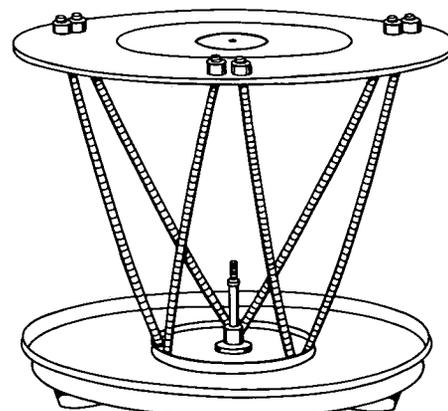


NASA Tech Briefs are issued by the Technology Utilization Division to summarize specific technical innovations derived from the space program. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151.

Collapsible Truss Structure Is Automatically Expandable



COLLAPSED



EXPANDED

The problem: There exists a requirement for a collapsible truss structure that can be automatically expanded. The structure when expanded must provide excellent rigidity and maintain close dimensional tolerance.

The solution: Coil springs wound with maximum initial tension, formed into a three-truss, closed-loop structure.

How it's done: Coiled springs, when used as truss members in such a configuration, have the ability to assume a rigid state within reliable dimensions when allowed to expand to their straightened position. In a space application, such a structure has been successfully designed to expand to 20 inches from a collapsed dimension of only 2 inches. In the expanded condition, the dimensional tolerance is ± 0.18 inch and the vibration frequency limit is greater than 10 cps. Collapse and compression of this structure without damage is easily

accomplished by application of a compound loading in excess of the compression load capacity of the truss structure. Various means may be used to release the structure from its collapsed configuration. One means that has been successfully employed uses a tungsten wire as the restraining medium. When a current is applied to the wire, it heats to the melting point, releasing the truss springs which then automatically extend to a straightened position.

Notes:

1. This innovation would be useful wherever automatic "pop up" to a predetermined dimension by remote control is required.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland, 20771
Reference: B65-10126

(continued overleaf)

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: General Electric Company
under contract to Goddard Space Flight Center
(GSFC-265)