

Method and Structure for a Solid Slug Caterpillar Piezoelectric Relay**ABSTRACT OF THE DISCLOSURE**

A method and structure for an electrical switch. A gas-filled chamber is housed
5 within a solid material. Contacts within the gas-filled chamber are coupled to the
solid material, while a plurality of piezoelectric elements within the gas-filled chamber
are also coupled to the solid material. A slug within the gas-filled chamber is
coupled to one or more of the plurality of contacts and further coupled to one or more
of the plurality of piezoelectric elements. A liquid metal within the gas-filled chamber
10 is coupled to the slug, and coupled to the plurality of contacts. One or more of the
piezoelectric elements are actuated, with the actuation of the one or more
piezoelectric elements causing the slug coupled to the one or more piezoelectric
elements to move from a first number of contacts to a second number of contacts
wherein the first number of contacts and the second number of contacts are wetted
15 by the liquid metal. The movement of the slug from the first number of contacts to
the second number of contacts breaks a liquid metal surface tension between the
slug and the first number of contacts and establishes a coupling between the slug
and the second number of contacts, thereby enabling the liquid metal switch to
change from a first state to a second state.

FIG. 2 ACCOMPANIES THIS ABSTRACT