UNITED STATES PATENT OFFICE

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THERMAL RELEASE DEVICE

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At present there are employed, particularly in switch constructions, thermal release devices in which a heating wire on a definite current strength being reached causes a fusible mass to soften after expiry of a definite interval of time as a result of which a toothed rotatable element of the release device is released and a spring controlled pawl moves out of engagement with the toothed portion and by its movement effects a release of the switch. Known releasing devices of this kind are comparatively complicated and require comparatively high heating energy, namely 1 or 2 watts and moreover suffer from the disadvantage that even although built to the same dimensions no two devices release after the same time interval with a given current strength.

These disadvantages are avoided by the invention, the essential feature of which consists in this that a rotatable hollow body filled with fusible material is directly mounted on the heating body, at least a part of which is in the form of a wire and a portion of which extends radially within the hollow body. In the accompanying drawings which illustrate two embodiments of the invention, Fig. 1 illustrates a release device in which the heating wire has the shape of a crank shaft and Fig. 2 is a section on the line A—B of Fig. 1. Fig. 3 shows a thermal release device of a preferred construction.

Referring to Fig. 1, the heating wire 1 carries a drum 2 or other hollow body which is formed or provided with teeth 3. The interior 4 of the drum 2 is filled with a fusible mass preferably an eutectic alloy. The walls bounding the space 4 are made other than cylindrical so that the drum 2 cannot rotate when the fusible mass is in cold condition. When the heating wire 1 reaches a definite temperature the mass is melted and the drum 2 is free to rotate. A portion of the heating wire 1 formed as a crank shaft describing a surface of revolution within the fused material. In a releasing device as shown in Figs. 1 and 2 of which the greatest dimension amounts to fractions of a centimetre, results can be obtained with a heating energy of about 0.6 watts.

In the embodiment shown in Fig. 3 in which the several parts are indicated by the same reference numerals as are employed in Figs. 1 and 2, the heating wire 1 is shaped as a crank shaft the cranked portion of which has been twisted through 90°. I claim,

1. In a thermal release, a resistance wire, a drum directly supported thereon, the resistance wire extending therethrough, fusible material filling said drum, the wire having a radially directed portion, the said material embedding the portion of the wire which is within the drum and also the said radially directed portion thereof, whereby to normally prevent rotation of the drum and whereby the fusing of the said material by heating of the wire upon the passage of an abnormally high current will permit the rotation of the drum.

2. In a thermal release, a resistance wire, a drum directly supported thereon, fusible material filling said drum, the portion of the wire which is within the drum being formed to provide a loop, the said material embedding the said portion of the wire and also the loop thereof, whereby to normally prevent rotation of the drum and whereby the fusing of the said material by heating of the wire upon the passage of an abnormally high current will permit the rotation of the drum.

3. In a thermal release, a substantially unitary resistance wire, a drum directly supported thereon, the resistance wire extending therethrough, fusible material filling said drum, the portion of the wire which is within the drum being formed to provide a crank radially directed portion, the said material embedding the said portion of the wire which is within the drum and also the said crank radially directed portion thereof, whereby to normally prevent rotation of the drum and whereby the fusing of the said material by heating of the wire upon the passage of an abnormally high current will permit the rotation of the drum.

4. In a thermal release, a resistance wire,
a drum directly supported thereon, fusible material filling said drum, the portion of the wire which extends within the drum, in a portion of its length being bent to form to simulate a substantially U-shaped crank shaft and having its said last-mentioned portion disposed in a plane at right angles to the axis of the said portion of the wire which extends within the drum, whereby to normally prevent rotation of the drum and whereby the fusing of the said material by heating of the wire upon the passage of an abnormally high current will permit the rotation of the drum.

5. In a thermal release, a resistance wire, a drum directly supported thereon, the said drum having a polygonal shaped interior wall, fusible material filling the said drum, the said resistance wire extending through the said drum, the portion of the said wire which is within the drum being formed with a substantially U-shaped off set portion and having the said latter portion disposed in a plane substantially at right angles to the axis of that portion of the resistance wire which extends within the drum, whereby to normally prevent rotation of the drum and whereby the fusing of the said material by heating of the wire upon the passage of an abnormally high current will permit the rotation of the drum.

In testimony whereof I have signed my name to this specification.

ERNST BESAG.