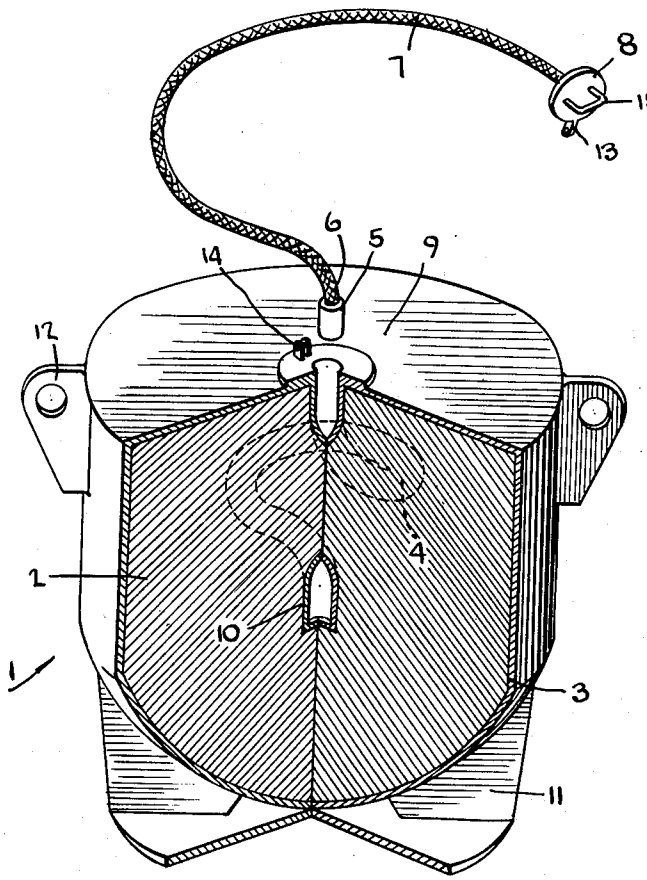
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N. F. RITCHEY

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SHIELDED CONTAINER

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INVENTOR.

NEIL F. RITCHEY

BY

Norman N. Holland

ATTORNEY

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SHIELDED CONTAINER

Neil F. Ritchey, Westtown, Pa., assignor to Knapp Mills Incorporated, Long Island City, N.Y., a corporation of New York

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The present invention relates to a container for radioactive materials and more particularly to a container which permits simplified irradiation procedures and which provides for the safe storage and shipment of radioactive materials.

The constantly increasing use of radioactive materials has created a need for a simple, safe, convenient and easily transportable lead shielded container. Many different types of containers are now used for storing and shipping radioactive materials. Some of these presently used storage containers are bulky and heavy and are unsuitable for use as shipping containers. Others of the presently known containers cannot be safely opened without the use of auxiliary shielding means. Typical known type of containers utilize a straight storage well which is covered by a plug or cover. The radioactive source is mounted on a cord or string within the well, usually called a fish line, so that the radioactive source can be lifted out of the container when the cover was removed. With this type of container, the removal of the cover immediately exposes the user to radiation from the storage well so that an auxiliary shielding means must be provided.

The present invention is an improvement upon presently used lead shielded containers and has for one of its objects the provision of a container for radioactive material which can be safely opened without the need of auxiliary shielding means.

Another object of the present invention is to provide a container for radioactive materials which can be used both as a safe storage means and a shipping container.

Another object of the present invention is to provide an improved and simplified lead shielded container which is safe, convenient and easily transported.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein the single figure shown in the drawings is a perspective view, partly in section, of a container embodying the present invention.

Referring to the drawing, the container of the present invention comprises a body or cask **1** having a lead core or shield **2** within an outer casing **3**.

The cask **1** has a cavity or passageway **4** therein which extends to approximately the center of the lead shield **2** for housing the radioactive matter or source.

The radioactive matter is contained in a standard capsule **5** which is mounted on one end **6** of a flexible cable or spring **7** and the capsule **5** is positioned at the inner end of the passageway **4** by the insertion of the cable **7** into the passageway **4**. The other end of the flexible cable **7** is attached to a cover **8** so that when the cable **7** is fully inserted in the passageway **4**, the

cover **8** abuts the center portion of the container lid **9**. When the cover **8** is removed, the flexible cable **7** can be withdrawn from the passageway **4** to withdraw the radioactive source from the cask **1**. It will be understood that the flexible cable **7** need not be attached to the cover **8** and, if desired, the cable may be left free of cover **8** to be grasped after the cover **8** is removed from the lid **9**.

The passageway **4** has an offset or curving portion in it so that the inner end of the passageway does not communicate on a straight line with its open end. Since the radiation emitted by the radioactive source travels in straight lines, the curving or offset portions in the passageway **4** prevent the radiation from passing to the open air when the cover **8** is removed as all the rays which are emitted from the source will strike a portion of the lead shield **2** surrounding the passageway **4**.

The preferred embodiment of the passageway **4** as illustrated in the drawing has a substantially helical path. Although a greater or lesser degree of curvature may be used, the existence of a slight scattering or reflection effect of the radioactive rays or particles from the walls of the passageway **4**, indicates that slightly more curvature is desirable in passageway **4** than the curvature which is necessary to displace its opposite ends from a straight line relationship with each other. Although the passageway **4** may be formed in any convenient manner, a satisfactory method comprises the casting or pouring of the lead shield **2** around a hollow tube **10** which is supported during the casting in its desired position with respect to the casing **3**. The tube **10** is left in place after the formation of the shield and it serves as a guide for the capsule **5** and the flexible cable **7**.

The casing **3** may have any suitable shape and is preferably formed of a strong rigid material such as iron or steel. Base members **11** are provided for support and suitable handles **12** are provided for lifting or otherwise handling the cask **1**.

Cooperating latching members **13** and **14** are provided on the cover **8** and the lid **9** respectively so that the cable **7** may be locked in place with a suitable lock or tamper-proof seal if desired.

When it is desired to remove the capsule **5** from the cask **1**, the seal or lock is removed from latching members **13** and **14** and the cable **7** is drawn out of the curved passageway **4** along with the attached capsule **5** by handle **15** on cover **8**.

While one passageway **4** is illustrated and described in the preferred embodiment, it is clear that additional passageways may be provided in the container to provide for the storage of additional capsules as desired.

It will be seen from the above that the present invention provides an improved lead shielded container for radioactive materials which can be opened without auxiliary shielding means, which can be used for both storage and shipping, and which is simple and relatively inexpensive to manufacture.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim:

1. A container for storing a radioactive substance comprising a solid cask of radioactive shielding material of generally circular cross section and having an axis and provided with an aperture in its surface in alignment with said axis and a terminal cavity located on said axis at the center of the cask so that the material of the cask completely surrounds said terminal cavity, a single passageway of substantially helical form having terminal portions communicating with said aperture and said ter-

minal cavity, whereby the solid radioactive shielding material at the bottom of the terminal cavity is adapted to stop the movement of a body of radioactive substance entered through the aperture and passed along the passageway to positively position the said substance in the terminal cavity and whereby emanations of radiation from said radioactive substance are obstructed.

2. A container as claimed in claim 1 including a flexible cable having a length equal to that of said passageway and removably positioned therein having its inner end adapted to carry said radioactive substance, and a cover adapted to close said outer aperture, the outer end

of said flexible cable being mounted on said cover, whereby closing of said aperture by said cover will automatically place said radioactive substance in said centrally located terminal cavity.

References Cited in the file of this patent

UNITED STATES PATENTS

2,750,517	Baum	June 12, 1956
2,798,164	Untermyer	July 2, 1957

FOREIGN PATENTS

1,079,640	France	Dec. 1, 1954