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EXPLOSIVE CHARGE CONTAINER AND
METHOD OF MAKING SAME

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

5 This invention relates to an explosive charge container and to a method of making the same.

The power of an explosive charge being exerted radially on the curved wall of the projectile acts to straighten out the wall and therefore breaks it
10 into long strips extending lengthwise of the projectile, the width of the strips being a satisfactory dimension for a fragment. In an effort to secure uniform fragmentation it has heretofore been proposed to score the casing or to form the casing
15 of a series of rings to interrupt its longitudinal continuity.

Modern practice tends towards a thin-walled shell providing for a maximum quantity of explosive charge. Because of the powerful propellants employed to increase muzzle velocity and range the projectile must be exceptionally strong to
20 withstand the shock of firing. Because of these requirements the method of scoring the casing or using a series of rings has not met with favor.

25 The present invention is based on the discovery that fragmentation of metal is influenced by the orientation of the crystals or grain of the wall of a container. The invention consists in forming a container in which the direction of the axis
30 of the crystals is circumferential.

One method of providing a container fulfilling this condition is to take one or more unformed or preformed rolled sheets of metal and form a container, welding the meeting edges. The direction
35 of rolling the sheets determines the direction of the long axis of the crystals and the formation of the container must conform to the direction of rolling so that the long axis of the crystals is circumferentially disposed.

40 A container of this character upon being shattered by an explosive charge was found to increase fragmentation about one hundred per cent over that obtained in shattering a container in which the direction of the axis of the crystals is
45 longitudinal or parallel to the axis of the container.

Shells made of pierced billets and forgings and having the axis of the crystals longitudinally disposed are subjected to a heat treatment consisting of annealing at 1600° F., furnace cooling, heating to 1525° F., quenching with oil, drawing
50 at 1150° F. and air cooling. This treatment slightly improves fragmentation but in the case of a shell having the axis of the crystals circumferential there is no improvement in fragmentation. Such treatment requiring considerable
55 time and expense can therefore be eliminated.

The invention finds application in the fabrication

tion of all types of missiles and containers designed to be fragmented by bursting charges of explosives.

I claim:

1. A method of influencing fragmentation of
5 a metal container upon bursting of an explosive charge in the container to obtain a large number of uniform fragments, which consists in forming the container by rolling a plurality of metal sheets to definitely orient the axis of the
10 metal crystals, assembling the sheets into the form of a container with the circumference conforming to the direction of rolling, and welding the meeting edges of the sheets.

2. A method of influencing fragmentation of
15 a metal container upon bursting of an explosive charge in the container which consists in rolling the metal of the container in the direction of the circumference of the container to dispose the long axis of the metal crystals in said direction.
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3. A method of influencing fragmentation of a metal container upon bursting of an explosive charge in the container which consists in forming the container with the long axis of the metal
25 crystals in the direction of the circumference of the container.

4. A cylindrical shell comprising two semi-cylindrical halves having a grain structure transverse to their length and butt-welded on longitudinal seams.
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5. A high explosive shell having a body of circular cross-section formed of metal having a grain structure extending circumferentially and having less resistance to bursting longitudinally
35 than to bursting circumferentially, said metal being joined to a continuous cylindrical-shape by longitudinal electric butt welds.

6. A high explosive shell having a body of circular cross-section, formed of metal having a grain structure extending circumferentially and having less resistance to bursting longitudinally than to bursting circumferentially.
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7. A high explosive shell having a body of circular cross-section, formed of metal having a grain structure extending circumferentially for influencing fragmentation of the metal body upon bursting to obtain a large number of substantially uniform fragments.
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8. A high explosive shell having a body of circular cross-section formed of metal having a grain structure extending circumferentially for influencing fragmentation of the metal body upon bursting to obtain a large number of substantially uniform fragments, said shell being composed of
55 a plurality of sections joined at their edges by butt-welds forming a continuous cylindrical shape.

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