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3,283,718

CARTRIDGE

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FIG. 1

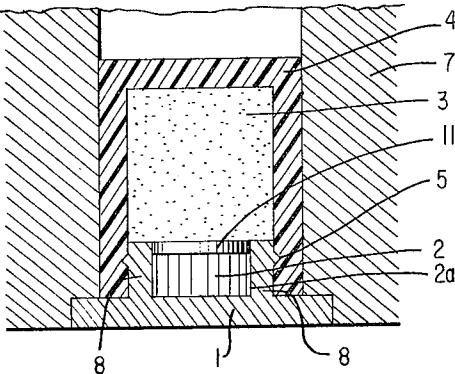


FIG. 2

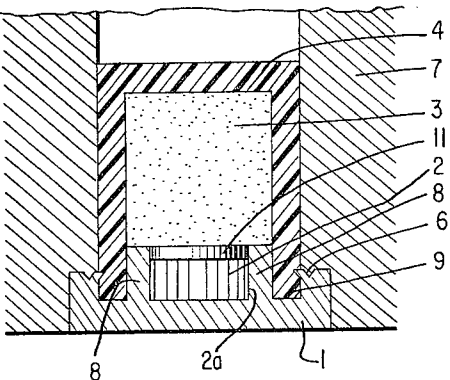
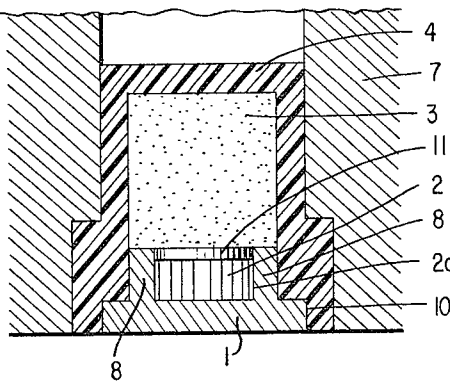


FIG. 3



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3,283,718 CARTRIDGE

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19 Claims. (Cl. 102—39)

The present invention relates to a cartridge, and more particularly, to a cartridge ignited by heat sensitive means.

The known methods for igniting cartridges are based on the use of mechanical or electrical energy. These prior art methods require very sensitive ignition mechanisms or fuses and are, therefore, very prone to malfunctions and failures.

The present invention is predicated on the task to create an ignition mechanism which is considerably more insensitive compared to the known mechanical or electrical ignition mechanisms, yet is very reliable in operation.

It is proposed according to the present invention to realize the release of the ignition mechanism of the cartridge by heat. For that purpose the cartridge essentially consists of a metallic headpiece with good thermal conductivity properties within which is disposed a heat sensitive primer composition, and of a case made of a material with poor thermal conductivity properties which contains the propellant means.

Accordingly, it is an object of the present invention to provide an ignition mechanism for cartridges which obviates the drawbacks and shortcomings encountered with the prior art devices by extremely simple means reliable in operation.

Another object of the present invention resides in the provision of an ignition mechanism for cartridges which is less sensitive than the known prior art devices yet is extremely reliable in operation and less prone to failure.

A further object of the present invention resides in the provision of an ignition mechanism for cartridges operable by heat which can be readily and accurately controlled.

A still further object of the present invention resides in the provision of a cartridge provided with an ignition device so constructed and arranged as to permit simple assembly of the parts.

These and other objects, features and advantages of the present invention will become more obvious from the following description when taken in connection with the accompanying drawing which shows, for purposes of illustration only, several embodiments in accordance with the present invention and wherein

FIGURE 1 is a partial cross sectional view through a first embodiment of a cartridge in accordance with the present invention in which the case is placed over a reduced cross sectional portion of the bottom.

FIGURE 2 is a partial cross sectional view through a modified embodiment of a cartridge in accordance with the present invention in which the case is embedded in a groove provided in the bottom, and

FIGURE 3 is a partial cross sectional view through still another modified embodiment of the cartridge in accordance with the present invention in which the bottom is embedded in the case.

Referring now to the drawing wherein like reference numerals are used throughout the various views to designate like parts, reference numeral 1 designates in all embodiments the headpiece of the cartridge which consists of a material having high thermal conductivity such as, for example, copper, aluminum, etc. The heat sensitive ignition or primer composition 2 is disposed in a recess 2a of the headpiece 1. The ignition or primer composition 2 is separated by a cover 11 from the propellant

means 3, the charge, properly speaking of the cartridge. The propellant means 3 is disposed in a cartridge case 4 made of a material with poor thermal conductivity, such as iron or plastic material, particularly of a readily destructible plastic material of any known type.

It may be appropriate for certain applications to make the case 4 of a combustible or burnable mass, for example, of NC-powder which burns together with the propellant charge and boosts the energy thereof.

The propellant means 3 itself consists, for example, of a smoke-free loose single-base or double-base powder. The cartridge is inserted into a magazine or cartridge support 7.

FIGURES 1, 2 and 3 illustrate three possible realizations of the connection of headpiece 1 and case 4.

In FIGURE 1, the headpiece 1 passes over into a neck portion 8 of reduced cross section. The case 4 is placed or slipped over this reduced cross sectional portion 8. The securing of the case 4 at the neck portion 8 takes place by the bead 5.

In the embodiment of FIGURE 2, the headpiece 1 is provided, in addition to the neck portion 8, with a groove 9 into which is inserted the case 4. In that case, the securing takes place in that the outer rim of the headpiece 1 is indented or notched and a ridge or rabbet is formed thereby which secures the case 4.

FIGURE 3 shows a connection of headpiece 1 and case 4 in which the neck portion 8 of the headpiece 1 is received within the case 4 and is completely surrounded by the same along the outer rim 10 thereof. In this case, the heat conduction from the headpiece 1 to the cartridge support 7 is at a minimum.

While we have shown and described several embodiments in accordance with the present invention, it is understood that the same is not limited thereto but is susceptible of numerous changes and modifications as known to a person skilled in the art, and we therefore do not wish to be limited to the details shown and described herein but intend to cover all such changes and modifications as are encompassed by the scope of the appended claims.

We claim:

1. A cartridge for driving shells, securing bolts, tools, and the like, comprising:

a metallic headpiece made of a material having good thermal conductivity,

a heat-sensitive primer composition within said headpiece,

and a generally tubular casing means having an open end and a closed end, said casing containing a propellant means and said open end secured to said headpiece, said casing means being made of a material having poor thermal conductivity,

said headpiece being provided with a groove-shaped recess, said casing means open end being inserted into said recess and being secured to said headpiece by an indentation in said headpiece.

2. A cartridge, comprising a main explosive charge; a generally tubular cartridge case means having a closed end and an open end containing said main explosive charge in its interior; headpiece means constructed of a relatively thick material having good thermal conductivity, said headpiece means having securing means operatively secured to said open end of said cartridge case means, said headpiece means having a recess opening into the interior of said cartridge case means; a relatively highly heat sensitive primer explosive charge within said recess in good thermal conductive relationship over a substantial portion of its exterior area with said headpiece means; said headpiece means being operable to substantially isolate said heat sensitive charge from exterior mechanical stress and being operable to readily conduct exteriorly

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applied heat to said heat sensitive charge for igniting said heat sensitive charge.

3. The device of claim 2, wherein said cartridge case means is a relatively poor conductor of heat.

4. The device of claim 3, wherein said headpiece means has an inwardly extending reduced diameter neck portion forming said recess, and wherein said cartridge case means encompasses and is attached to said neck portion operatively to thermally insulate said neck portion.

5. The device of claim 4, wherein said headpiece means has an outer inwardly facing annular portion radially spaced from said neck portion and encompassing said cartridge case means.

6. The device of claim 4, wherein said headpiece means has an outer rim of greater diameter than said neck portion and wherein said cartridge case means encompasses said outer rim operatively to thermally insulate said headpiece.

7. The device of claim 3, wherein said cartridge case means is constructed of a readily destructible plastic material.

8. The device of claim 3, wherein said cartridge case means is constructed of a combustible material that burns with the main explosive charge and boosts the energy of the main charge.

9. The device of claim 2, wherein said headpiece means has an inwardly extending reduced diameter neck portion forming said recess, and wherein said cartridge case means encompasses and is attached to said neck portion operatively to thermally insulate said neck portion.

10. The device of claim 9, wherein said headpiece means has an outer inwardly facing annular portion radially spaced from said neck portion and encompassing said cartridge case means.

11. The device of claim 10, wherein said cartridge case means is constructed of a readily destructible plastic material.

12. The device of claim 10, wherein said cartridge case means is constructed of a combustible material that burns with the main explosive charge and boosts the energy of the main charge.

13. The device of claim 9, wherein said headpiece means has an outer rim of greater diameter than said

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neck portion and wherein said cartridge case means encompasses said outer rim operatively to thermally insulate said headpiece.

14. The device of claim 13, wherein said cartridge case means is constructed of a readily destructible plastic material.

15. The device of claim 13, wherein said cartridge case means is constructed of a combustible material that burns with the main explosive charge and boosts the energy of the main charge.

16. The device of claim 9, wherein said cartridge case means is constructed of a readily destructible plastic material.

17. The device of claim 9, wherein said cartridge case means is constructed of a combustible material that burns with the main explosive charge and boosts the energy of the main charge.

18. The device of claim 2, wherein said cartridge case means is constructed of a readily destructible plastic material.

19. The device of claim 2, wherein said cartridge case means is constructed of a combustible material that burns with the main explosive charge and boosts the energy of the main charge.

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