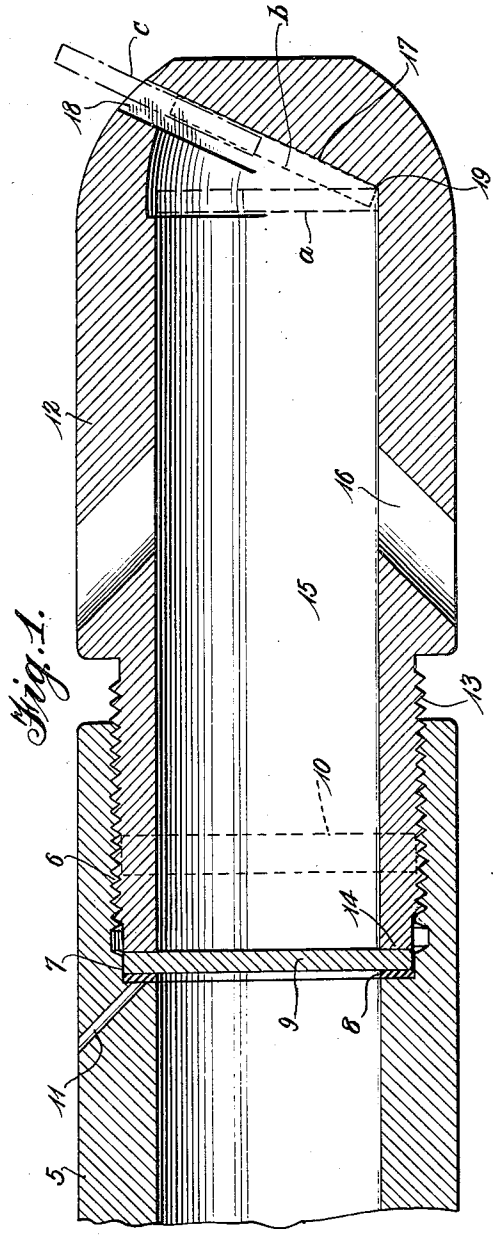
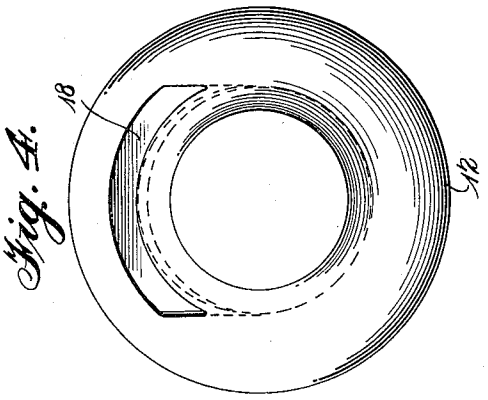
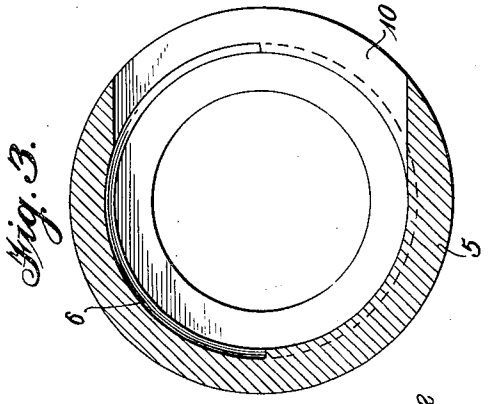
Jan. 31, 1939. L. D. MYERS 2,145,366

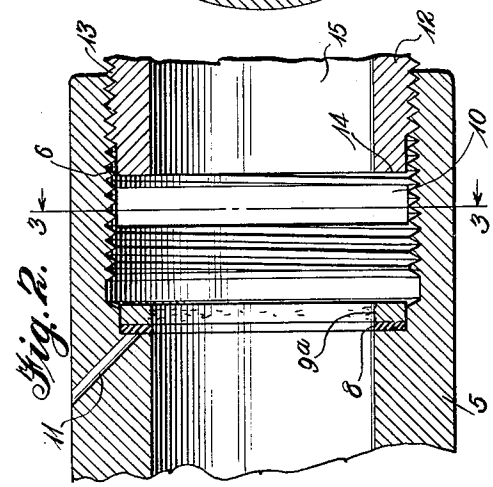
BLASTING CARTRIDGE

Filed Sept. 29, 1936









Inventor

Leonard D. Myers

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2,145,366

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BLASTING CARTRIDGE

Leonard D. Myers, Washington, D. C., assignor to Cardox Corporation, a corporation of Illinois

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20 Claims. (Cl. 102—6)

This invention relates to new and useful improvements in blasting cartridges and deals more directly with discharge mechanism for the same.

Patent No. 1,941,196, issued to Frank H. Armstrong on December 26, 1933, discloses in detail a form of blasting cartridge which employs carbon dioxide and a chemical heater unit for producing a blasting medium capable of breaking down material, such as coal. This type of cartridge has enjoyed extensive commercial use and employs a rupturable element, taking the form of a metal disc, which is supported in such a manner that the center of the same is sheared from the remainder of the disc by the force of the blasting medium within the container or body portion of the cartridge at the time the charge reaches the desired blasting pressure.

Every time a cartridge of this character is fired it becomes necessary to disconnect the discharge cap from the inner end of the cartridge body to permit the ruptured portions of the disc and a packing gasket to be removed and a new gasket and disc substituted therefor. This operation of completely disconnecting the discharge cap from the container or body portion of the cartridge necessarily requires time. The discharge cap and cartridge body are threadedly connected together. The need for reconnecting the cap to the cartridge container or body creates a problem of thread maintenance because an appreciable amount of thread damage occurs when the threads on the cap and cartridge body are not properly registered or aligned at the start of the connecting operation.

The primary object of this invention is to so construct the discharge end of cartridges of the type disclosed in the aforementioned Armstrong patent that it is possible to effect removal of the ruptured parts of a used disc and gasket and substitute a new disc and gasket without disconnecting the discharge cap from the container or body portion of the cartridge.

Other objects and advantages of the invention will be apparent during the course of the following description:

In the accompanying drawing forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a longitudinal sectional view of the discharge end of a blasting cartridge embodying this invention,

Figure 2 is a detail longitudinal sectional view of the structure illustrated in Fig. 1 and disclosing the means for accomplishing the removal of a used gasket and marginal portion of a used disc and the substitution of a new disc and gasket therefor,

Figure 3 is a transverse sectional view taken on line 3—3 of Fig. 2, and

Figure 4 is an end elevational view of the discharge cap of the cartridge.

In the drawing, wherein for the purpose of illustration is shown the preferred embodiment of this invention, the reference character 5 designates the inner or discharge end of a blasting cartridge of the type disclosed in the aforementioned Armstrong patent. The bore of this discharge end of the cartridge is increased in diameter and internally threaded, as at 6. Inwardly of this threaded bore portion, the cartridge body is provided with a seat 7 which receives a gasket 8 and a rupturable disc 9.

Intermediate the ends of the threaded portion 6 of the cartridge bore, a transverse opening 10 is formed in the wall of the cartridge. The dimension of this opening 10, circumferentially of the cartridge, is such that it will readily permit passage therethrough of gaskets and discs of the type designated by the reference characters 8 and 9. The dimension of the opening 10 longitudinally of the cartridge body 5 is such that it will readily accommodate the thickness of the gasket and disc.

Extending through the wall of the cartridge body 5 to terminate at its inner end in the seat 7 is a relatively small aperture 11. The use of this aperture will be explained at a later point.

The discharge cap 12 is provided with a threaded, reduced end portion 13 which is adapted to be threaded into the bore portion 6 of the cartridge body. When fully assembled, this cap 12 is threaded into the bore of the cartridge body until its inner extremity 14 bears tightly against the outer surface of the disc 9. This extremity 14 of the discharge cap is machined to provide a sharp edge at the juncture of the end face of the cap and the bore 15. This sharp edge functions to shear the center portion of the disc from the outer marginal portion when the disc is ruptured by the blasting medium contained within the cartridge body. The discharge cap is provided with any desired number of obliquely arranged discharge ports 16 which permit the blasting medium to be released from the bore of the discharge cap.

The outer end wall 17 of the cap bore is inclined or arranged at an acute angle with respect to the axis of the cap. A circumferentially extending opening 18 is formed in the end

of the cap and has one of its edges formed as a continuation of the inclined wall 17. This opening 18 is of proper size to allow for the ejection of the sheared central portion of the disc 8 when this sheared central portion is projected against the inclined wall 17 by the force of the blasting charge. Fig. 1 discloses the sheared central portion of a disc in three different positions. In the dash line position (*a*), the sheared portion of the disc has just reached a position where one of its edges contacts with the inner edge of the inclined wall 17. The force of the blasting charge against the inner face of the sheared portion of the disc causes the disc portion to pivot about the fulcrum point 19 formed at the juncture of the side wall of the cap bore and the inclined wall 17. The disc portion is then caused to move into the dotted line position (*b*) in which position it is flatly pressed against the inclined wall 17. The force of the blasting charge effects outward movement of the disc portion through the opening 18. This outward movement is clearly illustrated by the dot and dash disclosure (*c*) of the disc portion. The central portion of the disc is completely removed or ejected through the opening 18. The bore of the discharge cap is enlarged at 20 to accommodate the pivotal movement of the disc center.

After the cartridge has been fired and the central portion of the disc ejected through the opening 18 by the force of the blasting charge, the cartridge may be provided with a new gasket and disc when it is reconditioned for use. This substitution of a new gasket and disc for the used elements may be accomplished by backing off or partially unthreading the cap 12, relative to the cartridge body 5, until the cap reaches the position illustrated in Fig. 2. In this position, the inner extremity 14 of the cap has been moved past the opening 10 formed in the threaded portion 6 of the cartridge end. The cartridge and cap assembly may then be up-ended to cause the gasket 8 and the remaining marginal portion 9*a* of the disc to drop into register with the opening 10. By arranging the cartridge so that the opening 10 faces downwardly, the gasket 8 and disc margin 9*a* will be permitted to drop through the opening. Should the gasket and disc margin stick in the seat 7, a small tool may be inserted through the aperture 11 to free the gasket and disc margin from the seat. One or more of the apertures 11 may be provided, as found necessary. After the gasket and disc margin have been removed through the opening 10, a new gasket and disc may be inserted into the bore 6 through the opening and properly positioned within the seat 7 by the inward movement of the cap 12. The cap should again be threaded into the bore 6 until the disc and gasket are tightly clamped in the seat 7.

It is to be understood that the form of this invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto, a disc entirely positioned within and peripherally surrounded by the cartridge and rupturable to effect release of the blasting charge through the cap, and means for effecting replacement of a new disc for the ruptured one without detaching the cap from the container.

2. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto, an element entirely positioned within the container and clamped between portions of said container and cap, said element being rupturable to effect release of the blasting charge through the cap, and means for effecting replacement of a new element for the ruptured one without detaching the cap from the container.

3. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto and having a circumferentially extending opening therein, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder of the disc to effect release of the blasting charge through the cap, and means for ejecting the said sheared portion from the cartridge through said opening at the time of releasing the charge.

4. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder of the disc to effect release of the blasting charge through the cap, means for ejecting the said sheared portion from the cartridge at the time of releasing the charge, and means including a normally closed opening for effecting replacement of a new disc for the remainder of the previous disc without detaching the cap from the container.

5. A blasting cartridge comprising a container for confining a blasting charge, a discharge cap detachably connected thereto, and an element positioned within said cartridge and rupturable to effect release of the charge through said cap, said cartridge having openings formed therein constructed and arranged to permit of the substitution of a new element and the displacement of the ruptured portions of the former element without detaching the cap from the container, both of said openings being out of radial alignment with the element when the latter is in its operative position.

6. A blasting cartridge comprising a container for confining a blasting charge, a discharge cap detachably connected thereto and having a circumferentially extending opening formed therein, an element positioned within said cartridge and rupturable to effect release of the charge through said cap, and means in the cap for effecting removal of any portion of the element severed from the remainder through said opening, during rupturing of the element, at the time of releasing the charge.

7. A blasting cartridge comprising a container for confining a blasting charge, a discharge cap detachably connected thereto, an element positioned entirely within and completely surrounded by said cartridge and rupturable to effect release of the charge through said cap, means in the cap for effecting removal of any portion of the element severed from the remainder, during rupturing of the element, at the time of releasing the charge, and means associated with the cap and container for effecting removal of the remainder of the element and the positioning of a new element within the cartridge without detaching the discharge cap from the container.

8. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detach-

ably connected thereto, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder of the disc to effect release of the blasting charge through the cap, and means at the outer end of the discharge cap for effecting removal of the said sheared portion from the cartridge by the released charge, said means including a radially directed, circumferentially elongated opening.

9. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder of the disc to effect release of the blasting charge through the cap, means at the outer end of the discharge cap for effecting removal of the said sheared portion from the cartridge by the released charge, and means including a normally closed opening for effecting replacement of a new disc for the said remainder of the previous disc after adjustment of the cap and container relative to each other to uncover said opening but without detaching the cap from the container.

10. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto and having an opening out of axial alignment with the bore of the cap, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder of the disc to effect release of the blasting charge through the cap, and means for deflecting the sheared portion of the disc through the opening of the cap during its travel through the cap bore.

11. In a blasting cartridge, a container for confining a blasting charge and having a threaded portion at one end of its bore and a seat adjacent the inner end of said threaded portion, a gasket and a rupturable disc engaging said seat, and a discharge cap removably threaded in said end of the bore and clamping the gasket and disc against said seat, said threaded portion of the container having an opening formed therein positioned out of the plane of the seated disc so that a ruptured disc and its gasket may be removed and a new disc and gasket inserted through the opening when the discharge cap is partially backed away from said seat.

12. In a blasting cartridge, a container for confining a blasting charge and having a threaded portion at one end of its bore and a seat adjacent the inner end of said threaded portion, a gasket and a rupturable disc engaging said seat, a discharge cap removably threaded in said end of the bore and clamping the gasket and disc against said seat, said threaded portion of the container having an opening formed therein positioned out of the plane of the seated disc so that a ruptured disc and its gasket may be removed and a new disc and gasket inserted through said opening when the discharge cap is partially backed away from said seat, and means for freeing the gasket and disc from said seat in case of sticking of the same.

13. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto and having an axial bore extending only partly therethrough with a lateral opening adjacent the closed end of the bore, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder to effect release of the blasting charge through the cap, and means at the closed end of the cap bore for deflecting the sheared disc portion through said lateral opening at the time of releasing the charge.

14. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto and having an axial bore extending only partly therethrough with a lateral opening adjacent the closed end of the bore, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder to effect release of the blasting charge through the cap, and an angular wall surface in said cap bore for deflecting the sheared disc portion through said lateral opening at the time of releasing the charge.

15. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto and having an axial bore extending only partly therethrough with a lateral opening adjacent the closed end of the bore, a disc fastened within the cartridge and adapted to have a portion of the same sheared from the remainder to effect release of the blasting charge through the cap, and an angular wall surface in said cap bore for deflecting the sheared disc portion through said lateral opening at the time of releasing the charge, said cap bore being enlarged adjacent the lateral opening to allow for pivoting of the sheared disc portion during deflecting movement of the same.

16. In a blasting cartridge, a discharge cap having one or more radial discharge ports for a blasting charge and a circumferentially extending opening, and means operatively associated with the opening for ejecting through the same the sheared portion of a rupturable cartridge wall which is blown into the cap at the time of releasing the blasting charge from the cartridge.

17. In a blasting cartridge, a discharge cap having one or more radial discharge ports for a blasting charge and a circumferentially extending opening, and means for deflecting through said opening the sheared portion of a rupturable cartridge wall which is blown into the cap at the time of releasing the blasting charge from the cartridge.

18. In a blasting cartridge, a discharge cap having one or more radial discharge ports for a blasting charge and a circumferentially extending opening, and a wall surface in said cap so angularly arranged with respect to said opening as to deflect through the opening the sheared portion of a rupturable cartridge wall which is blown into the cap at the time of releasing the blasting charge from the cartridge.

19. In a blasting cartridge, a container for confining a blasting charge and having a threaded portion at one end of its bore, a seat adjacent the inner end of said threaded portion and an uninterrupted annular wall surrounding and concentric with said seat, a gasket and a rupturable disc engaging said seat and centered with respect thereto by said annular wall, and a discharge cap removably threaded in said end of the bore and clamping the gasket and disc against said seat, said threaded portion of the container having an opening formed therein axially displaced with respect to said annular wall so that a rupturable disc and its gasket may be removed and a new disc and gasket inserted through the opening when the discharge cap is partially backed away from said seat.

20. In a blasting cartridge, a container for confining a blasting charge, a discharge cap detachably connected thereto, a disc adapted to be ruptured to effect release of the blasting charge from

the container through the cap, said container and cap being so constructed and associated with respect to each other as to jointly completely surround and confine the marginal portion of the disc, and means operable upon ajustment of the cap relative to the container, but without detaching the cap from the container, for effecting displacement of a ruptured disc from its surrounded and confined position and the placement of a new disc into the position occupied by the former.

LEONARD D. MYERS.