

Feb. 28, 1939.

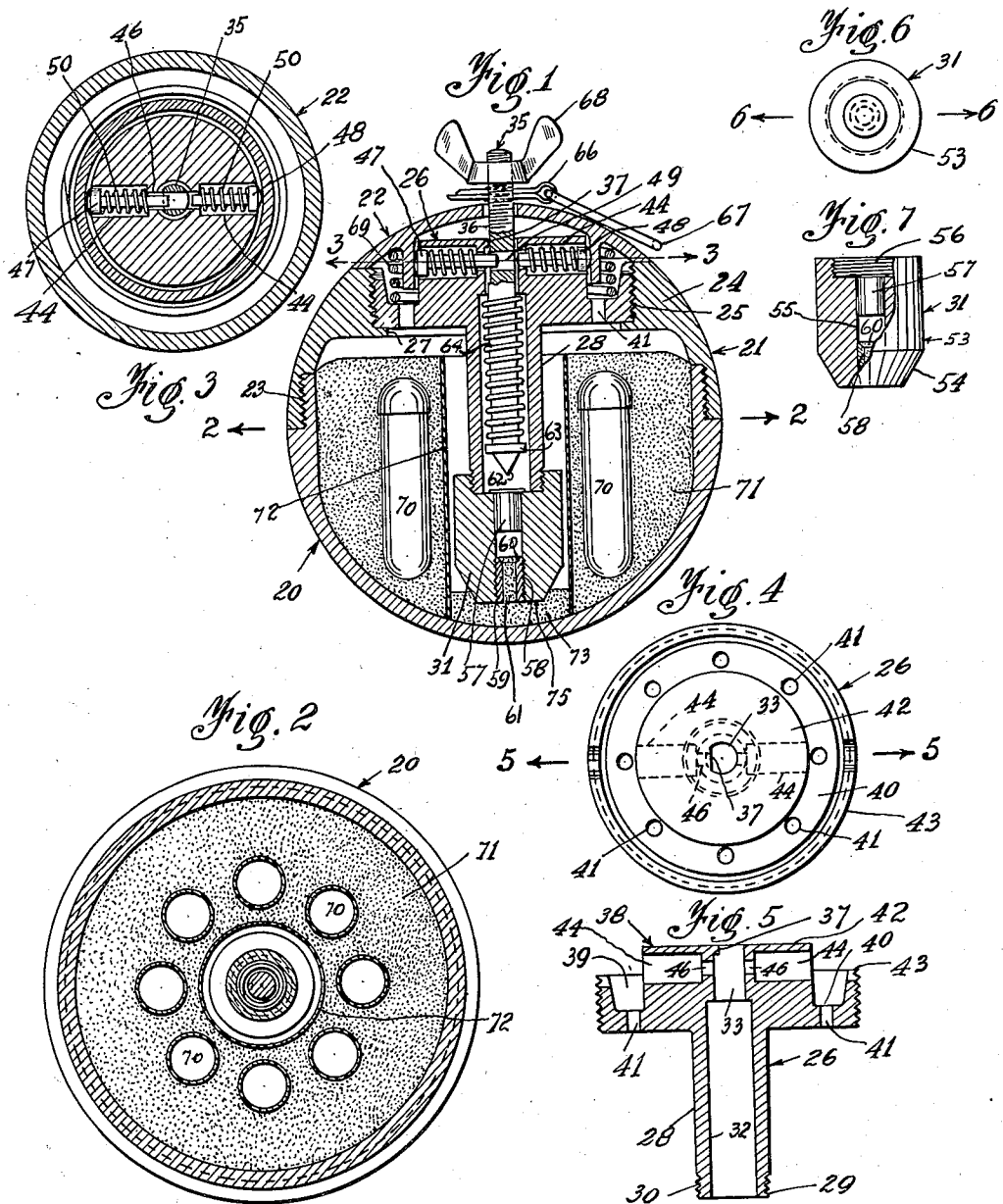
R. A. HUNTER

2,148,623

GRENADE

Filed May 12, 1937

2 Sheets-Sheet 1



Rex A. Hunter,

INVENTOR.

BY Ralph V. Smith

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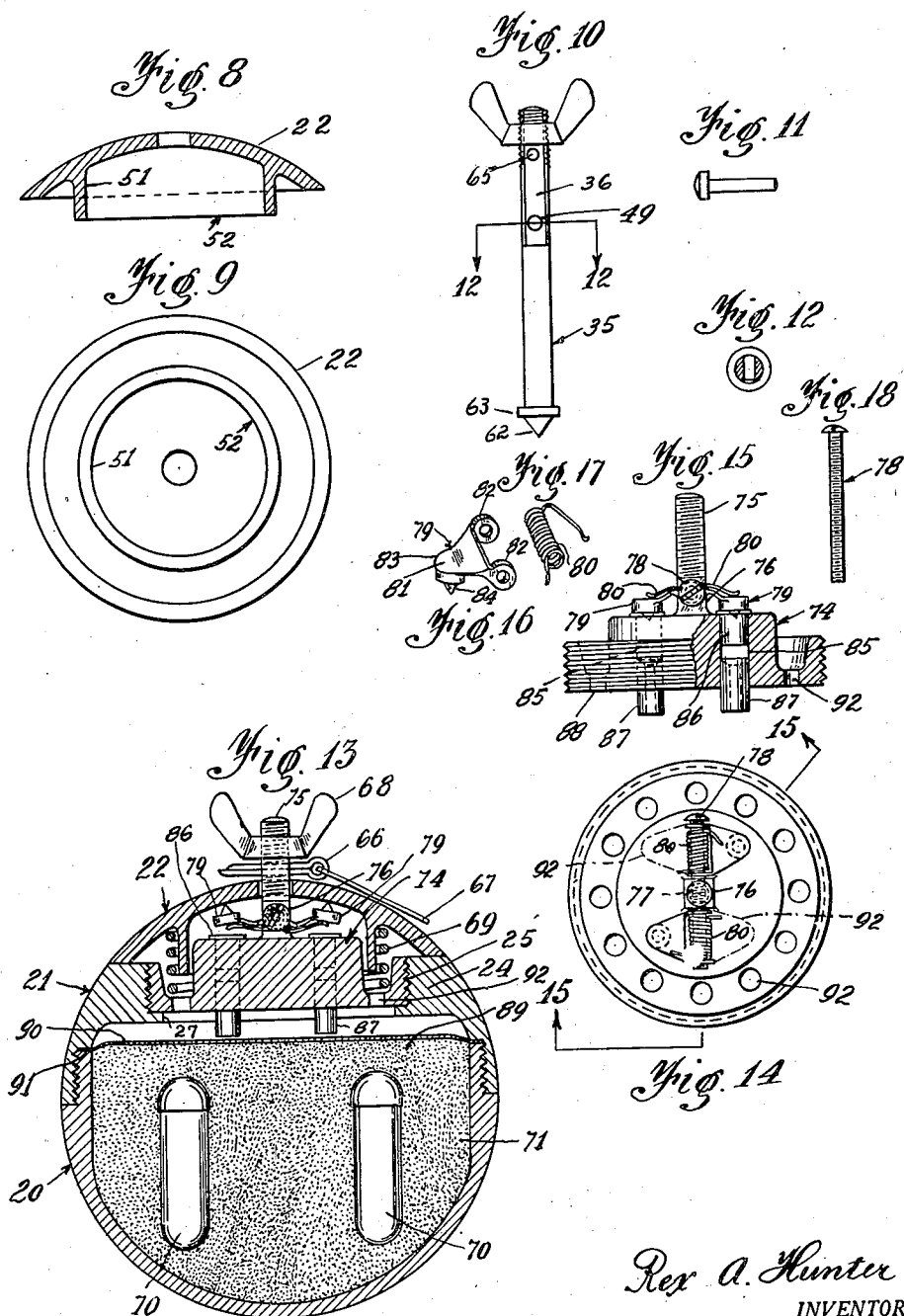
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,148,623

GRENADE

Rex A. Hunter, Bristol, Pa.

Application May 12, 1937, Serial No. 142,124

4 Claims. (Cl. 102—29)

This invention relates to grenades, and particularly to a grenade which liberates tear-gas or other disabling gases when discharged.

One of the objects of this invention is to provide a grenade which is completely assembled in the factory.

Another object of the invention is to provide a grenade which will not fail to discharge, due to improper assembly by the customer, when he is required to assemble certain parts such as the time-fuse-head (Bouchon-head).

Yet another object of the invention is to devise a grenade which has a series of safety locks which absolutely prevent accidental discharge.

Still another object of the invention is to produce a grenade which has the shape of a sphere instead of the conventional oblong shape.

Another object of the invention is to provide a grenade in which the time-fuse-head is within the spherical body.

A still further object of the invention is to produce a grenade which may be thrown a greater distance, due to its spherical shape, and which will roll around, after throwing, from place to place thus distributing the incapacitating gas over a large area thereby acting with a terrifying effect upon a mob.

My improved grenade is always in condition for immediate use and since the gas producing chemicals are hermetically sealed in suitable combustible containers as for instance shown in my Patent #1,961,364, dated June 5, 1934, the grenade may be readily stored for an indefinite period of time without deterioration. Many other objects and advantages of my invention will be apparent to those familiar with the art.

In the accompanying drawings, illustrating the present preferred embodiments of my invention;

Figure 1 is a longitudinal section through the center of a ball grenade embodying the invention.
Figure 2 is a horizontal section through the grenade along line 2—2 in Figure 1.

Figure 3 is sectional view along line 3—3 in Figure 1.

Figure 4 is a top view of the firing mechanism retainer.

Figure 5 is a sectional view of the firing mechanism retainer along line 5—5 in Figure 4.

Figure 6 is a top view of the primer and time-fuse-sleeve.

Figure 7 is a cross-sectional view on line 6—6 in Figure 6.

Figure 8 shows a sectional view of the cover of the grenade.

Figure 9 is a bottom view of Figure 8.

Figure 10 is an outline view of the firing-pin and wing nut.

Figure 11 shows one of the firing pin-retaining pins.

Figure 12 is a sectional view along line 12—12 in Figure 10.

Figure 13 is a sectional view of a modified form of my invention with parts shown in outline.

Figure 14 shows a top view of the striker carrier in the modification shown in Figure 13.

Figure 15 is a sectional view on line 15—15 in Figure 14.

Figure 16 is a perspective view of the striker as used in Figures 13 to 15 inclusive.

Figure 17 shows a perspective view of the 15 striker spring used in Figures 13 to 15, and

Figure 18 is a plan view of the screw which supports the strikers.

In the illustrated embodiment of my invention (Figures 1 to 13 inclusive) there is shown a 20 grenade comprising a bottom portion 20, a middle portion 21 and a cover 22 which, assembled, conform to the outline of a sphere.

The said bottom portion 20 of the grenade is made of suitable metal and is exteriorly threaded 25 adjacent the upper portion 23 to receive the interiorly threaded middle portion 21, as shown. The top end of said middle portion 21 is provided with a neck 24, which is interiorly threaded as indicated by the numeral 25, into which is screwed 30 the firing mechanism retainer 26 until it reaches the inwardly directed circular flange 27 of the neck 24. The said firing mechanism retainer 26 is provided with a downwardly and centrally disposed cylindrical extension 28, the lowermost 35 end 29 of which is provided with external threads 30 to receive the primer and time-fuse-sleeve 31. The bore 32 of said cylindrical extension 28 terminates at the upper end into a reduced bore 33, to freely receive the firing pin 35, and to prevent 40 turning of the latter in said bore 34 said firing pin 35 is provided with a flattened portion 36 which corresponds to the inwardly extending flattened lip 37 within said reduced bore 33, as shown in Figures 4 and 5. The top end 38 of said firing mechanism retainer 26 is provided with 45 a concentrically disposed groove or channel 39, the bottom 40 of which is provided with a series of equally spaced vent apertures 41.

The circular central top portion 42 of said firing 50 mechanism is slightly higher than the externally threaded rim 43. A pair of horizontally and oppositely disposed bores 44 are provided adjacent the upmost face 42 of aforesaid top portion 38, each having a reduced aperture 46 to freely ac- 55

commodate the locking pins 47 and 48, the latter of which being sufficiently short so as not to enter aperture 49 in firing pin 35, when in final assembly. An expansion spring 50 is coiled around each of said locking pins 47 and 48 which normally force these pins outwardly and against the inner surface 51 of the cylindrical depending ring 52 of the cover 22 of the grenade body.

As best shown in Figures 1, 6, and 7, the primer 10 and time-fuse-sleeve 31 comprises a cylindrical bar 53 having a tapered bottom 54, a central aperture 55 and an enlarged internally threaded counterbore 56 which is adapted to be screwed on the cylindrical extension 28 of the firing mechanism retainer 26. The numeral 57 indicates the primer which may be bought in the open market and the numeral 58 indicates the time-fuse also obtainable in the open market, the latter usually comprises an externally threaded ferrule 59 made from lead or similar material which is provided with a beveled counterbore 60 and filled with a booster composition or powder 61.

The firing pin 35 (Figures 1 and 10) is provided at its bottom with a conical strike point 62 merging into a circular flange 63, as shown, over which is coiled around an expansion coil spring 64. The upper part of said firing pin 35 has a flattened portion 36, a lower aperture 49 through which the locking pin 47 penetrates, when in assembled position and an upper aperture 65 adapted to receive a cotter-key 66 to which is attached the pull-ring 67. The upper end of said firing pin 35 is threaded to receive the wing-nut 68.

As heretofore stated, the cover 22 of the grenade body is provided with a depending ring 52 (Figures 1, 8, and 9) which also serves as a guide for a compression coil spring 69, the purpose of which will be explained later.

Referring to Figure 1 of the drawings there is shown a cross-sectional view of the assembled grenade, ready for use, the bottom portion 22 containing easy melting capsules 70, filled with an incapacitating gas such as chloracetophenone, etc. These capsules 70 are packed in a burning mixture 71 of any suitable composition around a sleeve 72 of celluloid or other combustible material.

The said sleeve 72 serves to separate said burning mixture 71 from the firing mechanism retainer 26 and primer and time-fuse-sleeve 31 it also serves to rapidly ignite the burning mixture 71 over a large area.

A small quantity of a quick combustible starting mixture 73 is placed in said sleeve 72 before the assembled firing mechanism 74 is inserted in its final position, as shown in Figure 1. In this position the lowermost end 75 of the primer and time-fuse-sleeve 31 including its time-fuse 58 penetrates the starting mixture 73 with the result, that said time-fuse 58 contacts the starting mixture 73.

Figure 1 shows the grenade in locked condition, ready for storing or shipping and it will be noted that I provide, in this construction four distinct locks to prevent accidental discharge of the grenade; firstly, the locking pin 47 which holds the firing pin 35 in cocked position, secondly, the depending ring 52 of the cover 22 which prevents the locking pin 47 from coming out of the aperture 49 of the firing pin 35, thirdly, the cotter key 66 and lastly, the wing nut 68. When so locked the grenade may be handled without injury and there are no outside vents through which gas may escape.

To throw the grenade, hold the cover 22 with

two fingers, remove the wing-nut 68 and pull out the cotter key 66. The grenade is now ready for action. When thrown, the cover 22 aided by the action of the tensioned coil spring 69, flies off, thus permitting the spring tensioned locking pin 47 to come out of engagement of the aperture 49 of the firing pin 35, thereby releasing the spring tensioned firing pin 35, the strike point 62 of which strikes the primer cap 57 which in turn ignites the time fuse 58 which sets the starting mixture 73 on fire, melting the celluloid tube 72 which ignites the burning mixture 71 thereby melting the capsules 70 the contents of which convert into disabling gas which is expelled rapidly and violently through the series of vents 41.

In the modified form shown in Figures 13 to 18 inclusive, the general construction of the grenade is analogous to the one previously described with the exception, that instead of using a single firing pin, two strikers are substituted. In order to avoid elaboration, I will only describe parts different from the preferred form of the invention heretofore described.

The intermediate portion 21 of the grenade body has a neck 24 which is provided with interior threads 25 to receive the striker-carrier 74, which, with the exception that the downwardly directed cylindrical extension 28 is omitted and the upwardly centrally disposed threaded stud 75 is added, is identical with the firing mechanism retainer 26 heretofore described.

The lower end 76 of said stud 75 is squared and provided with a threaded aperture 77 to receive the screw 78 which carries a pair of strikers 79 and the coil springs 80 in a manner as shown in Figures 13 to 15 inclusive.

These strikers 79, preferably made from sheet material consist of a triangular body 81 having outwardly and oppositely extending apertured ears 82, which are hingedly attached to said screw 78. The free end 83 of said triangular body 81 is provided with a conical striking pin 84 which is riveted or welded to the underside of said body 81 as best illustrated in Figure 16.

The striker carrier 74 is also provided with a pair of vertically disposed apertures 85 which are in alignment with the striking pin 84 when in assembled position, each of said apertures securely holds a primer 86 and a time-fuse 87, the latter of which extends beyond the lower face 88 of said striker carrier 74 so as to come, when in final position, in close proximity to the top of the burning mixture 89. If desired a protective covering 90 of celluloid or other easy combustible material may be provided over the burning mixture which is held in position between the joint 91 of the bottom portion 20 and the middle portion 21 of the grenade body.

Referring to Figures 13 and 14 it will be noted that the strikers 79, when in assembled position, are flapped over as shown in dot and dash lines (Figure 14) and indicated by the numeral 92, so as to tension the strikers 79 by the springs 80, and are held in that position by the cover 22.

To operate:

Remove wing-nut 68, then firmly hold the grenade by placing two fingers on the cover 22, pull out cotter key 66 and throw. Almost immediately, after throwing, the cover 22, aided by the tensioned coil spring 69, flies off, thereby releasing the spring tensioned strikers 79 which strike the primers 86 and ignite the time fuses 87, which in turn ignite the protective combustible covering 90, thus quickly igniting the burning mixture 89 in the grenade, thereby melting the

capsules 70, the contents of which convert into disabling gas which is violently and rapidly liberated and expelled through the vents 92 of the striker-carrier 74.

5 From the foregoing description, taken in connection with the drawings, it will be seen that my invention provides a grenade of the character set forth which is simple in construction and designed to carry out the objects of the invention in a reliable and efficient manner. It will, of course, be understood that while the constructions disclosed are preferred, changes for and within the scope of the appended claims may be made without departing from the spirit of or sacrificing any of the advantages of the invention.

What I claim is:

1. In a grenade, a spherical body comprising three parts, the bottom portion adapted to hold disabling gas producing chemicals, the intermediate portion forming a cover for said bottom portion and the upper portion forming the cap for said intermediate portion, a spring tensioned firing pin in said intermediate portion and protruding through said upper portion, a plurality of locking means to retain said spring tensioned firing pin in cocked and locked position, two of said locking means comprising a cotter-pin and a wing nut, both of which being adapted to be removed before throwing, and spring means effective on said upper portion of said spherical body to expel same upon removal of aforesaid cotter-pin and wing nut, said spring-tensioned firing pin independent of said spring means.

2. In a grenade, a spherical body comprising three parts, the bottom portion adapted to hold disabling gas producing chemicals, the intermediate portion forming a cover for said bottom portion and the upper portion forming the cap for said intermediate portion, a spring tensioned firing pin in said intermediate portion and protruding through said upper portion, a plurality of locking means to retain said spring tensioned firing pin in cocked and locked position, two of said locking means comprising a cotter-pin and a wing nut, both of which being adapted to be removed before throwing, an additional locking means for said firing pin comprising a pair of

horizontally and oppositely disposed spring tensioned locking pins, only one adapted to protrude a prepared aperture in the firing pin, and spring means effective on said upper portion of said spherical body to expel same upon removal of aforesaid cotter-pin and wing nut, said spring tensioned firing pin independent of said spring means.

3. In a grenade, a spherical body comprising three parts, the bottom portion adapted to hold disabling gas producing chemicals, the intermediate portion forming a cover for said bottom portion, and the upper portion forming a cover for said intermediate portion and provided with a depending circular flange, a spring tensioned firing pin in said intermediate portion and protruding through said upper portion, a plurality of locking means to retain said spring tensioned firing pin in cocked and locked position, two of said locking means comprising a cotter-pin and a wing nut both of which being adapted to be removed before throwing, an additional locking means comprising a pair of horizontally and oppositely disposed spring tensioned locking pins, only one adapted to penetrate a prepared aperture in said firing pin but both adapted to come in frictional engagement with said depending circular flange of said upper portion of said spherical body, and spring means effective on said upper portion to expel same upon removal of aforesaid cotter-pin and wing nut, said spring tensioned firing pin independent of said spring means.

4. In a grenade, a spherical body comprising three parts, the bottom portion adapted to hold disabling gas producing chemicals, the intermediate portion forming a cover for said bottom portion, and the upper portion forming a cap for said intermediate portion, a firing mechanism carrier secured in said intermediate portion, said carrier having an upwardly and centrally disposed shank protruding beyond the upper portion of said spherical body, a plurality of firing mechanisms hingedly mounted on said shank and locking means for said firing mechanisms, and independent spring means effective on said upper portion of said spherical body to expel same upon removal of said locking means.

REX A. HUNTER.