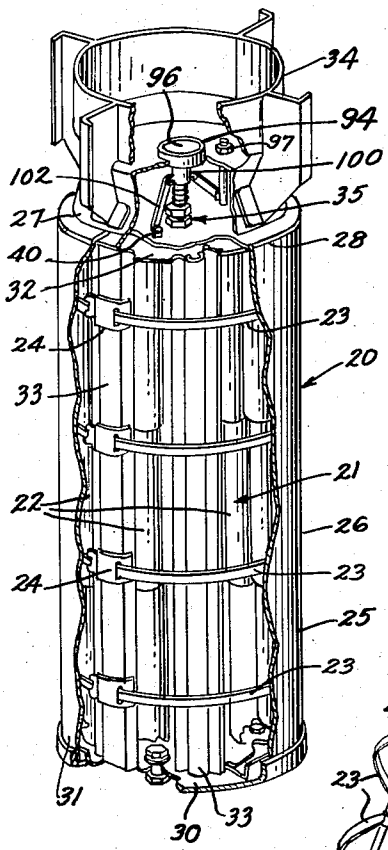
Feb. 24, 1959 G. H. CARDIFF 2,874,639

AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTOR AND RELEASE MECHANISM THEREFOR

Filed May 21, 1954 5 Sheets-Sheet 1

Fig. 1.



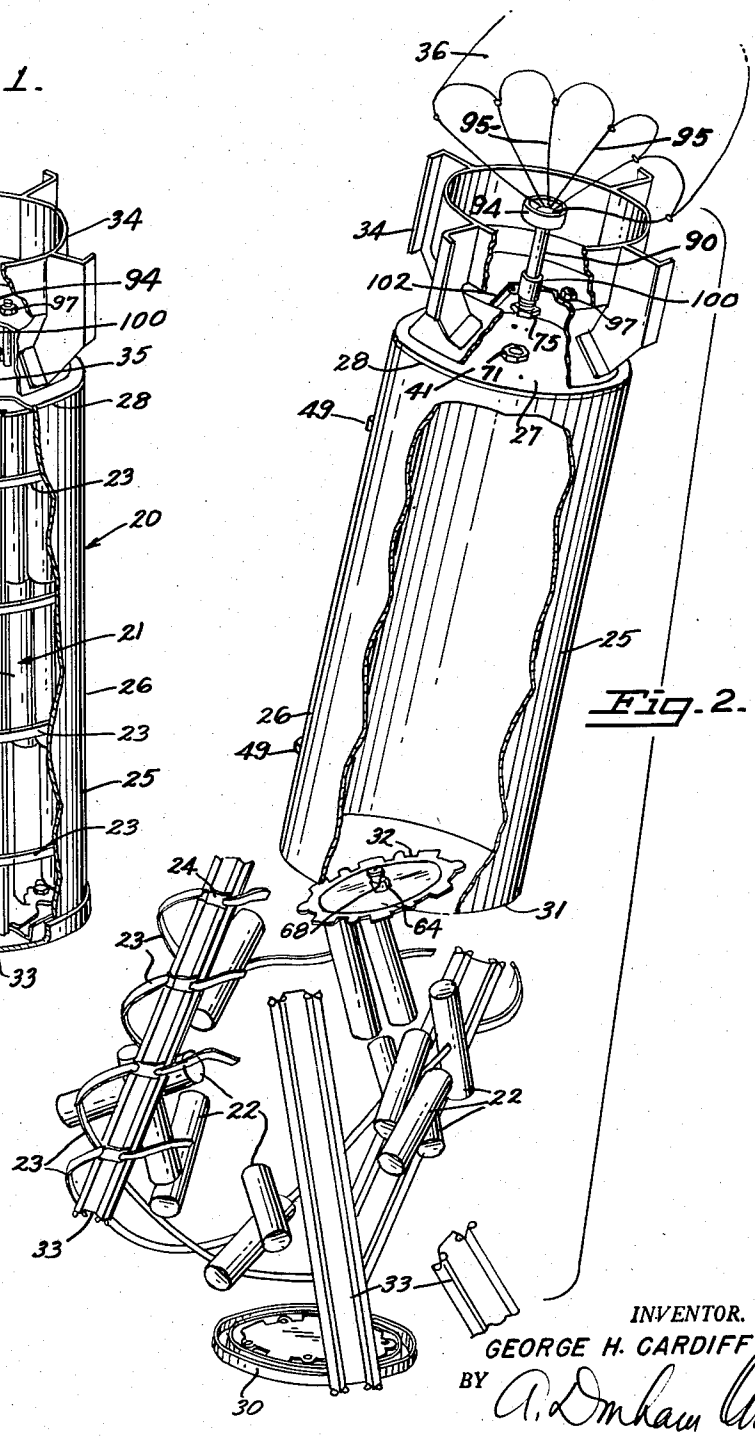


Fig. 2.

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AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTOR AND RELEASE MECHANISM THEREFOR

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Fig. 3.

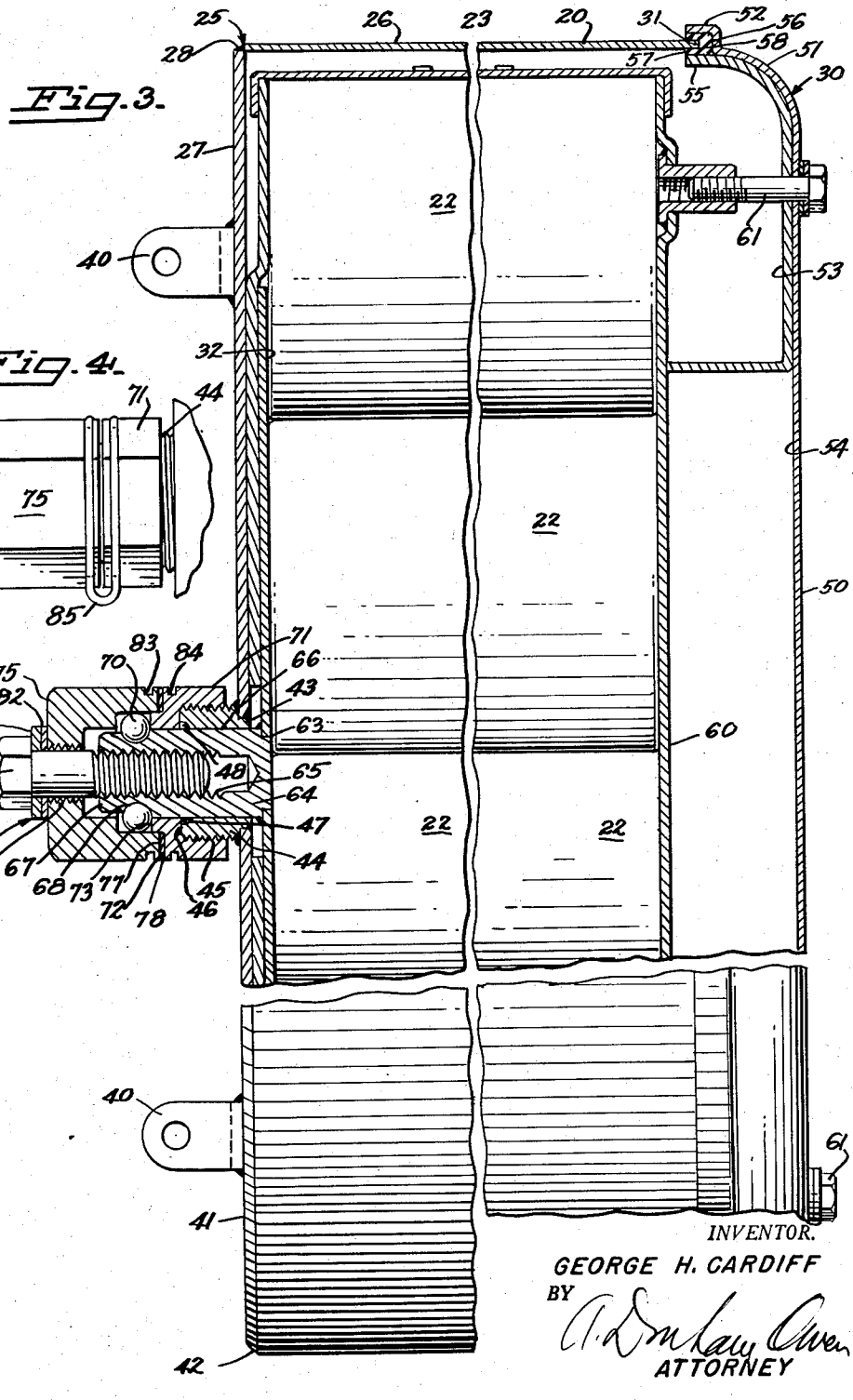


Fig. 4.

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AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTOR AND RELEASE MECHANISM THEREFOR

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Fig. 5.

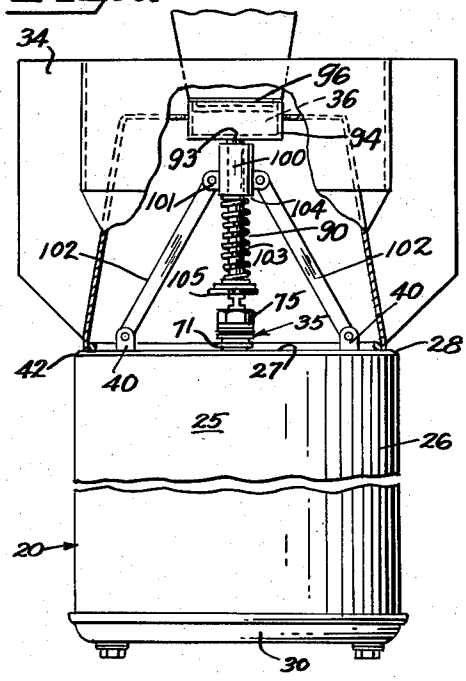


Fig. 6.

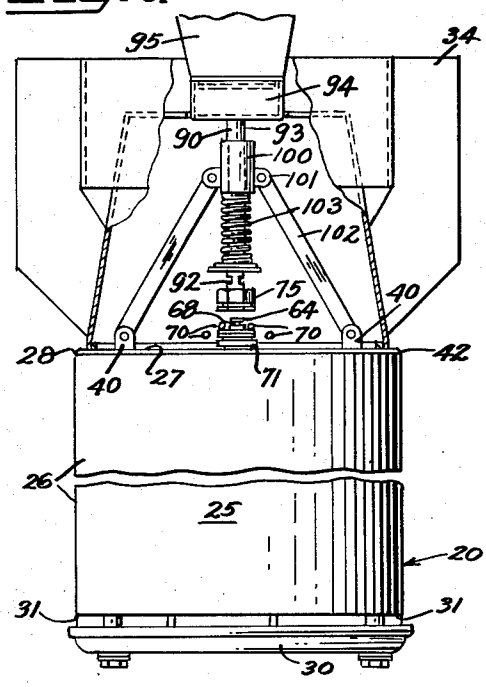


Fig. 7.

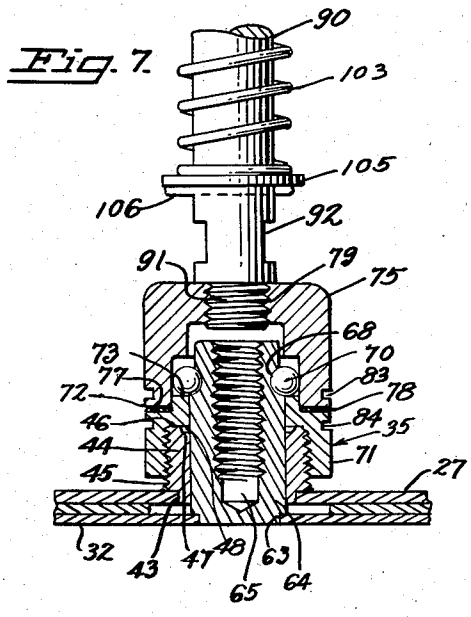
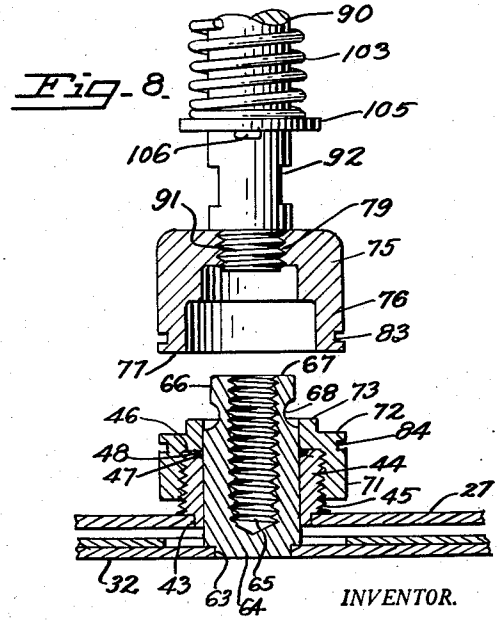


Fig. 8.



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AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTOR AND RELEASE MECHANISM THEREFOR

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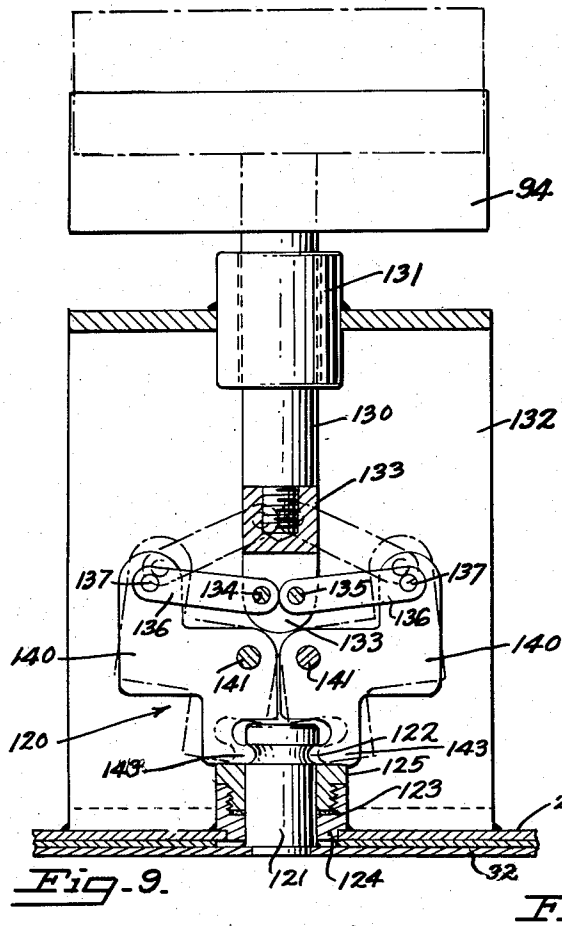


Fig. 9.

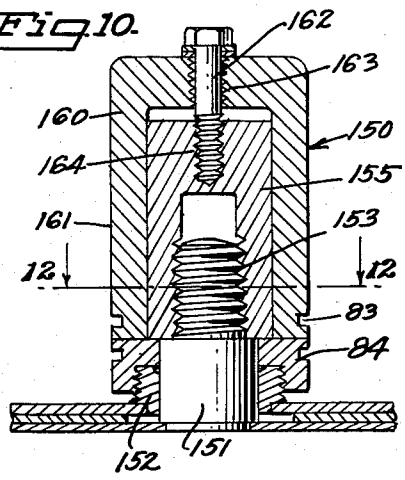


Fig. 10.

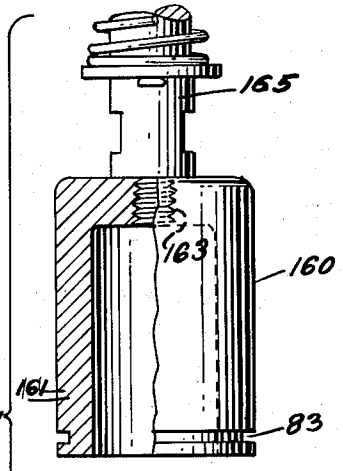


Fig. 11.

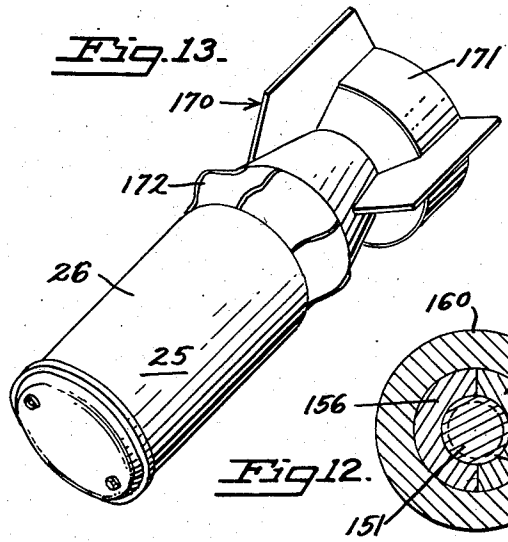
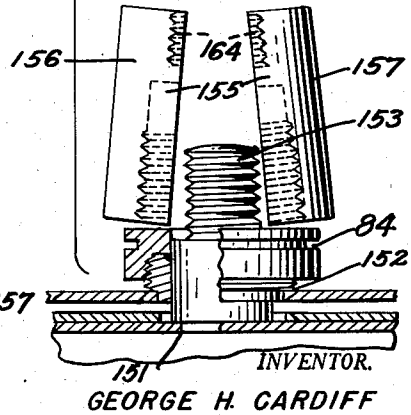


Fig. 13.

Fig. 12.



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AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTOR AND RELEASE MECHANISM THEREFOR

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Fig. 14.

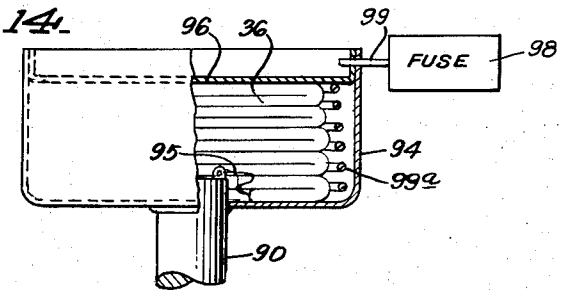


Fig. 15.

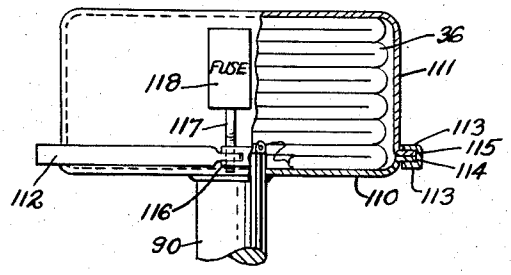
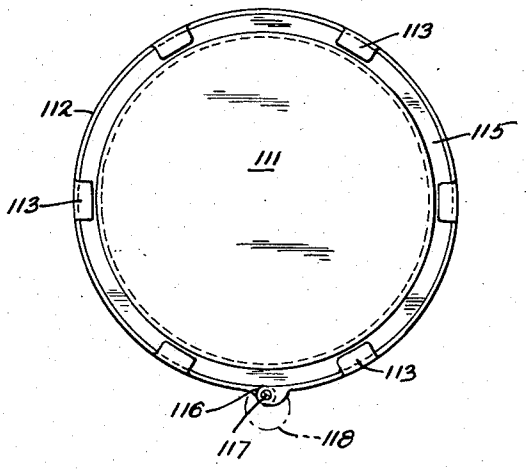


Fig. 16.



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United States Patent Office 2,874,639 Patented Feb. 24, 1959

2,874,639

AIMABLE BOMB CLUSTER ASSEMBLY AND ADAPTER AND RELEASE MECHANISM THEREFOR

George H. Cardiff, San Mateo, Calif., assignor to Fraser & Johnston Co., San Francisco, Calif., a corporation of California

Application May 21, 1954, Serial No. 431,519

15 Claims. (Cl. 102—7.2)

This invention relates to improvements in an aimable bomb cluster assembly, a container or adapter therefor, and a release mechanism that opens the container to effect dispersion of the bombs.

Small bombs, whether incendiary, fragmentation or other type, are often conveniently handled in a group of many individual bombs held together in a single container and known as an "aimable bomb cluster." These clusters are advantageous not only in the storage and transportation phases of logistics, but also in the operational action of dropping the bombs on a target, for obvious savings and increased effects on the target are obtained by dropping each cluster as a unit. However, for proper results the cluster must include a mechanism that, at a predetermined time or altitude, opens the container and ejects all the bombs therefrom, so that they will disperse and will produce their full effects rather than expending their force inside the container.

Heretofore, clusters were opened explosively, by blowing apart certain connections that held the container case together and held the bombs therein. Predetermined seam lines and areas of weakness were provided in an attempt to control this explosive action, but with indifferent success. Often the explosive detonation crushed or damaged many bombs, greatly reducing the efficiency of the bombing operation and thereby causing expensive waste. Some types of clusters frequently failed to discharge properly, so that their effect was practically nullified.

In attempts to remedy these difficulties, various designs were tried, some of them very costly and so difficult to manufacture that they were ill-suited to quantity production. The fact that each cluster case has to be airtight and capable of retaining substantial interior pressure without leakage—up to the time it is opened—increased the difficulties. Consequently, there has been widespread dissatisfaction among manufacturers, because of production difficulties, and the frequent operation failures and frequent damage to the bombs caused similar dissatisfaction among the military.

The present invention solves these problems by providing a cluster assembly well suited to quantity production and practically fool-proof in its operation. A leading feature of this cluster is that, instead of being blown apart explosively, it is opened by the action of drag upon a novel release mechanism. The drag, availed of through a parachute or other means, uses the air velocity which is always present in a free-falling object to effect the unloading of the cluster.

Other objects and advantages of the invention will appear from a description of some preferred embodiments thereof presented in accordance with 35 U. S. C. 112.

In the drawings:

Fig. 1 is a view in perspective, with some portions broken away, of an aimable bomb cluster embodying the principles of my invention.

Fig. 2 is a view in perspective of the cluster of Fig. 1 shown just after it has opened. Again some portions have been broken away, to show the interior.

Fig. 3 is an enlarged view in elevation and in section of the cluster shown as assembled for shipping and storage, before the tail is armed. The drawing has been broken in the middle and elsewhere to conserve space.

Fig. 4 is a view in elevation of the releasing mechanism of the shipping assembly of Fig. 3.

Fig. 5 is a view in elevation, on a reduced scale and broken in the middle, of the complete armed assembly with the tail in place.

Fig. 6 is a view similar to Fig. 5 showing the relation of the parts as the cluster begins to open.

Fig. 7 is a view in section on the scale of Fig. 3 of the release mechanism of the armed cluster.

Fig. 8 is a view like Fig. 7 of the release mechanism shown in its releasing position.

Fig. 9 is a view in elevation and in section of an alternative form of release mechanism, of the toggle type. The locked position is shown in solid lines, and the released position is shown in dot-dash lines.

Fig. 10 is a view in elevation and in section of another modified form of release mechanism, of the split-nut type, shown in its locked position.

Fig. 11 is a view similar to Fig. 10, showing the position of the parts as the release mechanism opens.

Fig. 12 is a view in section taken along the line 12—12 of Fig. 10.

Fig. 13 is a view in perspective of the rear end of a modified form of cluster-adapter, employing a different type of drag mechanism, shown with the drag mechanism in operating position.

Fig. 14 is a view in elevation and partly in section of the parachute canister and parachute, showing the release means for opening the canister.

Fig. 15 is a view similar to Fig. 14 of a form of canister and release.

Fig. 16 is a top plan view of the canister shown in Fig. 15.

In general, the present invention comprises an aimable bomb cluster that comes apart as it falls, because of the sudden production of drag operating on a release mechanism. The downward acceleration of the free falling cluster provides great momentum that carries the bombs out of the decelerated casing and effectively disperses them. There are many specific means for accomplishing the functions of several of the important parts of this invention, but in order to comply with the statute, a few of them which themselves have particular advantages will be described in detail.

General description of the device of Figs. 1–8 and its general operation

Figs. 1 and 2 illustrate the general appearance and operation of a preferred form of aimable bomb cluster **20**. A package **21** of relatively small bombs **22** may be held together, by belt straps **23** with automatically releasable buckles **24**, inside a casing or container **25**. The casing **25** comprises a cylindrical wall **26** and an integral rear end wall **27** which preferably are seam welded together to form a hermetic closure **28** at the rear end of the casing **25**.

A separable nose assembly **30** forms an airtight closure for the forward end **31** of the casing **25**. The nose assembly **30** is shown connected to the bomb package **21** and to a rear plate assembly **32** by means of lengthwise rigid bars **33** that are encircled by the peripheral belt straps **23**.

Outside the casing **25** and connected to it is a finned tail **34** and a release mechanism **35** that normally connects the tail **34** and casing **25** to the rear-plate assembly **32**, and therefore holds the bomb package **21** and the nose assembly **30** inside the casing **25**. In a manner that will be explained later, this mechanism **35** is released by

drag, which is produced by a parachute **36** that is opened at some predetermined time during the fall of the cluster **20**.

The drag on the parachute **36** causes sudden deceleration of the casing **25**, so that the momentum of the bomb package **21**, the nose assembly **30** and the rear-end assembly **32** can actuate the release mechanism **35**. Then the bomb package **21** and plates **30** and **32** are disconnected from the casing **25** and projected out of the forward end of the casing **25**. As soon as they are outside the casing **25**, the buckles **24** release the peripheral belt straps **23**, and the package falls apart. As bombs **22** continue on down toward the target area, they become somewhat dispersed, and when their fuses go off, they are free to expend themselves on the target.

The cluster casing 25

As stated above, the casing **25** is cylindrical with a closed rear end wall **27**. Since these two parts **26** and **27** are unitary, one way of effecting the closure is by the seam weld **28**, which will be completely airtight. Of course, it is possible to make the cylindrical wall **26** and end wall **27** in one piece, should that be a practical production method. The fin assembly **34** may be secured to the end wall **27** by two or more studs **97**.

In practicing certain preferred forms of the invention I provide three clevises **40** on the outside face **41** of the rear wall **27** for attachment of the drag mechanism in a manner described later herein (see Fig. 3). Preferably the clevises **40** are spaced 120° apart and are located at substantially the same radius, in between the outer periphery **42** or the rear wall **27** and a central opening **43**.

The end plate **32** is connected to the release mechanism **35** through the central opening **43**, and in the form of my invention shown in Figs. 1 to 8 a guide sleeve **44** is secured, as by welding, to the rear casing wall **27** and extends rearwardly therefrom through the opening **43**. The guide sleeve **44** may have exterior threads **45**, and its rear (outer) end **46** may have a radially-inward recess **47** to accommodate an annular sealing gasket **48**. The cylindrical wall **25** may be provided exteriorly with hooks **49** or other means for handling the cluster **20** and loading it into the aircraft.

The nose assembly 30

The nose assembly **30** (see Fig. 3) includes a nose plate **50**, generally disc-shaped but curled back axially at its outer edges **51** and provided with an annular offset rim **52**. An annular spacer plate **53** may be spot-welded or otherwise secured to the inner surface **54** of the nose plate **50** with its radially-outward rim **55** cooperating with the offset rim **52** to provide between them an annular recess **56** that receives a ring gasket **57**. The gasket **57** may be provided with an annular recess **58** in which the forward end **31** of the casing **25** fits. Preferably, the gasket **56** is made from material that will not bond to the metal casing **25**. It may be material such as that set forth in military specification No. G3065–2, a neoprene which continues some waxy substances. Or it may comprise a synthetic rubber gasket coated with a mold-release fluid, such as a silicone fluid. At any rate, well-known materials are available which will provide a pressure-tight seal between the casing **25** and the nose assembly **30** without bonding the gasket **57** to the metal parts, so that when the nose assembly **30** is released, its momentum will instantly carry it away from the casing without sticking.

The nose assembly **30** also includes a notched front-end-plate assembly **60** for the bomb package **21**. This assembly **60** may be spaced from the nose plate **50** by spacer plate **52** and secured to them by cap screws **61**, suitable washers being provided so that the fitting is pressure-tight.

Linking of nose assembly 30 to the bomb package 21 and rear plate 32

The front-end-plate assembly **60** may be linked to the rear-end-plate assembly **32** by means of the bars **33**, of which there may be three or more. This structure is conventional, as the structure by which the bombs **22** are held together inside the bars **33** between the front-end-plate assembly **60** and rear-end assembly **32** by the belt straps **23**, as noted before. The buckles **24** hold the straps **23** tightly enough to hold the bombs **22** in the package **21**. However, as soon as the bombs are projected out of the casing **25**, the buckles **24** will open, and the bombs **22** will be set loose.

The rear end plate assembly 32

The rear-end-plate assembly **32** may be provided with a central opening **63** somewhat smaller than the opening **43** through the casing end **27**, and a locking shaft **64** may be welded or otherwise rigidly or integrally secured to the plate **32** and extend rearwardly through and beyond the opening **63**. The locking shaft **64** has an interiorly threaded recess **65** and has a generally smooth, cylindrical outer surface **66** provided adjacent its outer end **67** with an annular groove **68**, preferably semi-circular in cross section. It will be seen that the locking shaft **64** fits inside the guide sleeve **44** and is slidable with respect thereto. When the release mechanism **35** permits, it will slide axially there, when the entire noseplate assembly **30**, rear-end assembly **32** and the bomb package **21** slide out from the casing **25**.

The release mechanism 35

Broadly speaking, the release mechanism **35** includes the locking shaft **64**. It also includes a plurality of metal balls **70** adapted to fit in the annular groove **68** and cooperate with other parts to lock the shaft **64** in place. The balls **70** may be steel, but they need not be ball-bearings; they can be unground and rough.

A hexagonal interiorly-threaded ball-stop sleeve **71** is threaded around the guide sleeve **44**, compressing the gasket **48** against the guide sleeve **44** and the release shaft **64**, thereby completing the leak-tight seal of the casing **25**. The sleeve **71** has a radially outer end shoulder **72** and also a radially-inner, axially-outwardly-stepped shoulder **73** that engages the balls **70**.

A ball-release cap **75**, has an annular skirt **76** whose end wall **77** compresses an annular flat gasket **78** against the shoulder **72** of the ball-stop sleeve **71**. When seated in this manner, the cap **75** holds the balls **70** in place in the groove **68**, where they engage the ball stop sleeve **71**. So long as this condition exists, the locking shaft **64** cannot slide out through the sleeve **43**, and the package **21** is held in the casing **25**.

A central interiorly threaded opening **79** extends through the cap **75**; this opening **79** is oversize with respect to the threaded recess **65** in the locking shaft **64**. During shipment and storage a shipping screw **80** is preferably slid through the oversize opening **79** of the cap **75** and threaded into the recess **65** in the locking shaft **64**, thereby positively holding the cap **75** against and around the ball stop sleeve **71** and therefore holding the package **21** in the casing **25**. Suitable washers **81** and **82** may be provided to protect the cap **75**. It will be noted that the diameter of the screw **80** is enough smaller than the central opening **79** of the cap **75** so that there is no threading engagement therewith.

Since the screw **80** is removed when the cluster **20** is armed, the release mechanism **35** would then come apart; in order to prevent this, an annular groove **83** may be provided in the cap **75** around its outer periphery, and another similar groove **84** may be provided around the outer periphery of the ball-stop sleeve **71**. A hairpin-shaped retaining yoke **85** may then be snapped into and across these two grooves **83** and **84**, linking the cap **75**

and sleeve 71. After the arming of the cluster 20 is completed, this retaining yoke 85 is taken off and discarded.

The release actuating mechanism

When the cluster assembly 20 is to be armed and loaded into the aircraft, the shipping screw 80 is withdrawn and in its place is threaded a release shaft 90 which is part of the drag mechanism. The threaded end 91 of the shaft 90 is too large to be threaded into the locking shaft 64 and is instead threaded only into the opening 79 of the release cap 75, the keyed portion 92 of the shaft 90 being used to assist in tightening. The outer end 93 of the release shaft 90 may be rigidly secured to a parachute canister 94, which contains the parachute 36 and is secured thereto by shrouds 95. When the parachute 36 is folded inside the canister 94, it is covered by a lid 96.

A drag collar 100 may be slidably mounted around the shaft 90 adjacent the outer end 93 thereof. The collar 100 is provided with three clevises 101, on which three drag links 102 are pivotally mounted. During the arming, these drag links 102 are also pivotally secured to the clevises 40 on the rear end wall 27 of the casing 25.

A helical coil spring 103 encircles the shaft 90 and is held under compression, one end being retained in a recess 104 in the collar 100, while the other end bears against a washer 105 held in position by a cotter pin 106 that extends through the shaft 90. The compressive action of the spring 103 urges the ball-release cap 75 normally in toward the rear end wall 27 and thereby normally holds the release mechanism 35 together, with the balls 70 in the groove 68. However, when the parachute 36 is opened, the sudden drag is sufficient to overcome the spring pressure, and the shaft 90 slides relatively to the drag collar 100 (see Fig. 6) carrying with it the ball-release cap 75 and thereby opening the release mechanism 35.

Actuation of the parachute 36 may be accomplished by a detonation cap or by spring apparatus or by any sort of mechanism which will open the canister lid 96 and project the parachute 36 out. For example, Fig. 14 shows the canister 94 with its lid 96 and an opening fuse 98 which pulls a pin 99 that normally holds the lid 96 and canister 94 together. When the fuse 98 is activated, and pulls the pin 99, then the lid 96 falls away from the canister 94. Such fuse mechanisms 98 are well known in the military art and need not be described here. Actuation may be initiated by a timer or by an air pressure device or by any other means which will accomplish the desired results, and these, too, are well known in the military art.

Figs. 15 and 16 show a modified form of canister with a lower portion 110 and an upper portion 111 held to it by means of a spring metal band 112 having some side clip portions 113 which envelop the flanges 114 and 115 of the canister portions 110, 111. The spring band 112 is held together by a yoke arrangement 116 where its ends meet, through which a pin 117 passes. When the fuse 118 is activated, it pulls the pin 117 out from the yoke 116, and the spring band 112 immediately straightens out, thereby releasing the canister top 111 from the canister base 110.

Assembly of the device of Figs. 1 to 8

In assembly, the nose 30 and rear plate 32 are held together by the bars 33, and the bombs 22 are packed between them and secured there by fastening the straps 23 in the buckles 24. This bomb package 21 is then inserted through the forward end of the casing 25 until the locking shaft 64 extends out through the guide sleeve 44. The ball-stop sleeve 71 may be threaded around the guide sleeve 44, compressing the gasket 48, either before or after insertion of the bomb package 21. The balls 70 are placed in the groove 68 and then the cap 75 is placed over the sleeve 71 and locked in place by screwing the shipping screw 80 into the locking shaft 64. The hook 85 may then be snapped into the grooves 83 and 84 as an added safety.

When arming the unit 20, the shipping screw 80 is removed, and, while the hook 85 holds the release mechanism 35 together, the release shaft 90 is threaded into the cap 75 and the drag links 102 are attached to the clevises 101. This attaches the drag release mechanism to the casing 25. Then the cluster 20 may be put aboard the bomber, usually being handled by the hooks 49.

Operation of the device of Figs. 1 to 7

The bomb cluster 20 is taken aloft over the target area and is dropped in the normal manner just as a bomb would be dropped. As it falls through the air, it accelerates rapidly, and at the desired time or altitude, the canister lid 96 opens and the parachute 36 is projected out of the canister 94. The sudden drag produced by the parachute 36 exerts a sudden strong outward pull on the release shaft 90, greater than the pressure of the spring 103. This pull compresses the spring 103 and moves the shaft 90 outwardly, away from the rear end 27 of the casing 25, carrying with it the cap 75. As soon as the cap 75 is pulled a short distance away from the shoulder 72 of the ball-stop sleeve 71, the balls 70 drop out and the locking shaft 64 is then free to slide through the guide 44, even though the spring 103 should later snap the cap 75 back, for once the balls 70 have been released nothing holds the shaft 64. Since the bomb package 21 has considerable momentum and is still being accelerated by gravity, it immediately pulls away from the casing 25, which is being held back by the parachute 36. The gasket 57 permits this to be done quickly, and the bomb package 21 falls out the nose of the casing 25. As soon as the package 21 is outside the casing 25, the straps 23 and buckles 24 are insufficient to hold the package 21 together and the bombs 22 disperse, as desired.

Modified form of release mechanism of the toggle type (Fig. 9)

A modified form of release mechanism 120 is shown in Fig. 9. This mechanism 120 is of the toggle type. The casing 25 and the bomb package 21 are constructed exactly as described before, with the exception that in place of the locking shaft 64 there is a locking shaft 121 which need not be threaded interiorly or have any recess but does have a groove 122 around its outer periphery. To keep the assembly airtight, a gasket 123 may be provided between the guide sleeve 124 and a collar 125.

The release shaft 130 may again be attached to the parachute canister 94 and extends through a collar 131. This collar 131 may be secured to a U-shaped bracket 132 which is rigidly attached to the casing 25. The inner end 133 of the shaft 130 may be provided with two through openings 134. Pivot pins 135 extend through the openings 134 and pivotally secure links 136 thereto, the opposite ends of the links 136 being pivotally secured by pins 137 to each of a pair of toggle arms 140. The toggle arms 140 themselves are pivotally secured to pins 141 which extend across and are supported by the two arms of the bracket 132, and are provided with end claws 143, which extend into the annular groove 122.

The location of the pins 135 above the center and inside the centers of the pins 141 brings about a positive action normally holding the toggle mechanism closed, so that no spring is required here, although one may be used if desired. However, when the drag mechanism jerks the shaft 130 outwardly, the force exceeds the toggle force holding the claws 143 locked, and the shaft 130 moves outwardly, pulling the links 136, thereby rotating the toggle arms 140 and opening the claws 143. This releases the locking shaft 121, and the bomb package 21 is ejected by its own momentum from the casing 25.

Modified release mechanism—split-nut type (Figs. 10 to 12)

A split-nut type of release mechanism **150** is shown in Figs. 10 to 12. Here a locking shaft **151** extends through a guide sleeve **152**, and the locking shaft **151** has an outer threaded end **153**.

A split nut **155**, that is, a nut that has been sawed into two halves **156**, **157**, is slipped over the threaded end or stud **153** of the shaft **151** and engages the threads. Thus nut **155** will come apart unless positively held together, and, therefore, a release cap **160** is provided, having a depending skirt **161** that surrounds the nut **155** and holds it together, and in position around the stud **153**. During shipping, a screw **162** is slid through an oversize threaded opening **163** and is screwed into an opening **164** in the split nut **155**.

During arming, the shipping screw **162** is replaced by a shaft **165** like the shaft **90**, and the release mechanism **150** may otherwise be identical to the release mechanism **35**. Thus, there may again be a yoke **85** retained in grooves **83** and **84**. When the drag of the parachute **36**, or other drag mechanism, pulls the cap **160** away from the rest of the release mechanism **150**, the split nut **155** falls apart into its two pieces **156** and **157**, the locking shaft **151** slides out through the guide sleeve **152**, and the bomb package **21** is then ejected from the casing **25**.

Alternative form of drag mechanism

One modified form of drag releasing mechanism **170** is indicated in Fig. 13. Here the entire tail assembly **171** is connected by shrouds **172** to the casing **25**. Normally the tail **171** is held closely against the rear plate **27**, but at a desired time it is released, so that there is a sudden drag. Any of the release mechanisms previously described may be used with this or any other type of drag mechanism which will give the desired results. Actuation may be the same as for the parachute **36**.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. In a bomb cluster having a casing having a rear end wall, a bomb package in said casing, and a casing closure member that normally seals said casing airtight, the combination therewith of: a locking shaft secured to said package and extending out through said rear end wall of said casing; latching means engaging a portion of said locking shaft and preventing relative movement therebetween; drag-producing means; a lost-motion connection between said drag-producing means and said casing; retainer means connected to said drag-producing means and normally holding said latching means in engagement with said shaft; and release means for disconnecting said retainer means from said latching means and actuable by said drag-producing means upon the production of drag thereby prior to the transmission of the drag to said casing through said lost-motion connection, whereupon said latching means is released from said locking shaft, so that said locking shaft and said package and closure member part from said casing, latching means, and drag-producing means by being freed from the drag thereon.

2. The combination of claim 1 in which: said locking shaft is generally cylindrical and provided with an annular groove near its outer end; said latching means comprises balls in said groove and a two part sleeve element slidably mounted around said locking shaft and rigidly secured to said casing with one end engaging said balls so as to prevent relative axial movement; in which said retainer means comprises a cylindrical tubular cap surrounding said balls in said groove and rigidly connected to said drag-producing means, so that upon actuation of said drag means, said cap is moved axially away from said sleeve sufficiently to permit the balls to fall out of said groove, whereupon there is nothing to prevent relative movement between said locking shaft and said casing.

3. The combination of claim 2 in which said sleeve comprises a tubular guide sleeve rigidly secured to said casing in said opening with said locking shaft extending through it and beyond it, said guide sleeve being exteriorly threaded; an interiorly threaded ball-engaging sleeve threaded around said guide sleeve, with said locking shaft extending therebeyond; and a gasket compressed between said guide sleeve and said ball-engaging sleeve and against said locking shaft, to make a pressure tight seal for said casing prior to the release of the package therefrom.

4. The combination of claim 2 in which said cap has a threaded interior opening therethrough for connection to a release shaft forming part of said drag-producing means, the end of said release shaft being threaded; the outer end of said locking shaft having an interiorly threaded recess smaller in diameter than said cap opening; whereby during shipment said release shaft can be replaced by a cap screw extending through said cap and threaded into said locking shaft.

5. The combination of claim 2 in which said drag-producing means is connected rigidly to a release shaft, in which said release shaft is slidably mounted in a positioning sleeve connected rigidly to said casing to provide the lost-motion connection, and in which spring means urges said cap into its ball-retaining position, while drag on said drag-producing means counteracts said spring means so that said cap is moved into its ball releasing position, said spring means also cushioning the initial shock of the drag.

6. The combination of claim 1 in which there is: a groove near the outer end of said locking shaft and in which said latching means comprises toggle means controlled by said retainer means and normally engaged in said groove, so as to link thereby said casing to said locking shaft, so that actuation of said drag-producing means withdraws said toggle means from engagement in said groove.

7. The combination of claim 1 in which a portion of the projecting portion of said locking shaft is threaded, in which said latching means comprises an axially split nut engaging said threads, one end of said nut engaging a projecting portion of said casing to prevent said relative movement, in which said retainer means includes a cylindrical sleeve normally surrounding said nut and retaining it in place, while upon actuation of said drag means said sleeve is moved away and said nut can fall apart so that said relative movement becomes possible.

8. An aimable bomb cluster of the type adapted to hold a plurality of bombs within an airtight container and to unload them therefrom after the cluster has been dropped, including in combination a hollow casing having an open forward end and a closed rear end wall, all its walls being imperforate except for an opening through said rear end wall; a closure member sealing the forward end of said casing but separable therefrom by a difference in applied axial accelerations; a separable bomb package inside said container attached to said closure member for movement therewith, said package being adapted to fall apart and disperse the bombs when outside said casing; a rigid member secured to said package at the rear end thereof and having a portion extending out the opening through said rear wall; means for sealing said rigid member with respect to said rear wall opening, said rigid member being movable relative to said sealing means so as to break the seal; releasable locking means locking said rigid member in its sealed position in said opening; and self-contained drag-producing means connected to said locking means and to said casing, whereby upon sudden deceleration of said drag-producing means said locking means is released and said closure member, bomb package, and rigid member are projected out through the opened forward end of said casing.

9. The cluster of claim 8 wherein said drag-producing means includes a parachute.

10. The cluster of claim 8 wherein said releasable locking means includes an annular groove near the outer end of said rigid member, balls in said groove, means secured to said casing and engaging said balls, and a cap holding said balls in said groove and connected to said drag-producing means, so that upon actuation of said drag-producing means said cap is removed sufficiently for said balls to fall out from said groove, whereupon relative movement between said rigid member and said casing becomes possible.

11. The cluster of claim 8 wherein said releasable locking means includes a groove near the outer end of said rigid member and toggle means joining said drag-producing means to said rigid member by engaging in said groove, so as to link thereby said casing to said rigid member, so that actuation thereof withdraws said toggle means from engagement in said groove.

12. The cluster of claim 8 wherein said releasable locking means includes a threaded portion of the projecting portion of said rigid member, an axially split nut engaging said threads, one end of said nut engaging said casing to prevent said relative movement, and a cap normally retaining said nut in place and connected to said drag-producing means for movement away from said nut during said sudden deceleration, whereupon said nut falls apart, enabling said relative movement.

13. In an aimable bomb cluster having an airtight casing and a bomb package inside said casing joined to a member sealing the front wall of said casing and movable therewith away from said casing, the combination therewith of: a longitudinal rigid member connected to the rear end of said bomb package and projecting through and beyond the rear end wall of said casing in slidable relation thereto, said longitudinal member having latching means thereon; drag-producing means connected to said casing by a lost-motion connection, including a shaft mounted for a limited amount of sliding movement relative to said casing, said drag-producing means when actuated being adapted to produce drag initially on said shaft and subsequently on said casing; a second latching means cooperating with the aforesaid latching means to lock said longitudinal member relative to said casing, said second latching means being held in its latching position by said

shaft and released therefrom when said shaft slides relative to said casing; and means to actuate said drag-producing means, whereby said shaft releases said latching means, and the momentum of said bomb package carries it out from said casing when the drag acts on said casing.

14. The combination of claim 13, wherein said shaft is normally spring-urged into the position where it holds the two latching means together, the initial drag moving said shaft and compressing said spring.

15. An aimable airtight bomb cluster including in combination a generally cylindrical casing open at its forward end and closed at its rear end by a wall having a central axial opening with a guide sleeve extending rearwardly therethrough; a separable closure member adapted to provide a releasable airtight seal against the forward end of said casing; a separable bomb package inside said casing and connected to said forward closure member for movement therewith relative to said casing, said package when out of said casing being adapted to fall apart and effect dispersal of its bombs; a locking shaft secured to the rear end of said package and extending out beyond said rear end wall through said guide sleeve; releasable latching means engaging said locking shaft and holding it against movement relative to said casing; drag-producing means, including means normally holding said latching means in engagement with said locking shaft and lost-motion means to release said holding means on the initial production of drag for allowing movement of said locking shaft, bomb package, and forward closure member relative to said casing, said drag-producing means being connected to said casing by said lost-motion means providing said release before producing drag on said casing.

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