Feb. 22, 1949. W. C. HASSELHORN 2,462,744

BOMB BAND ASSEMBLY

Filed Aug. 5, 1943 4 Sheets-Sheet 1

Fig. 1.

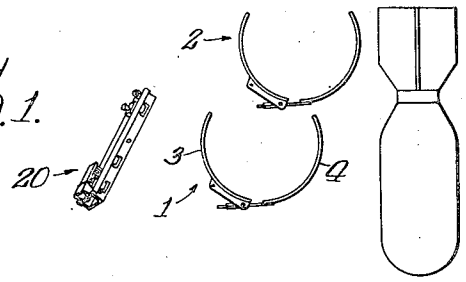


Fig. 2.

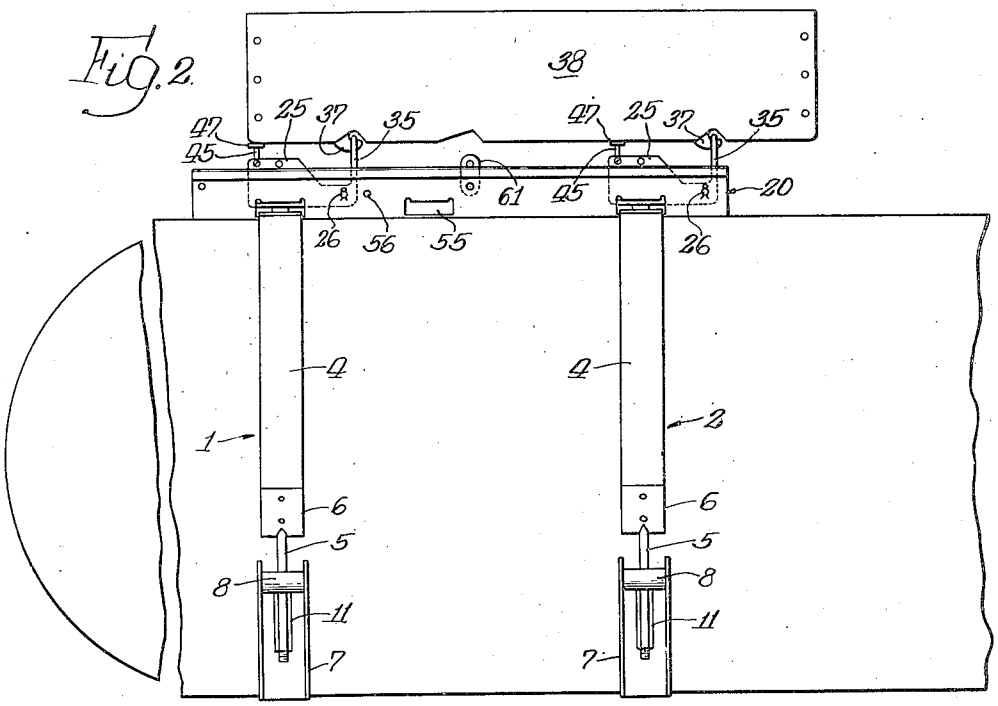


Fig. 3.

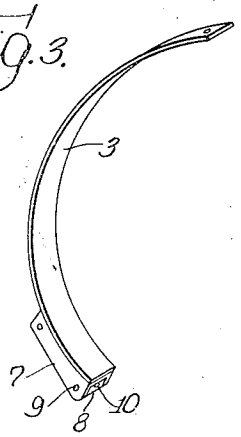


Fig. 4.

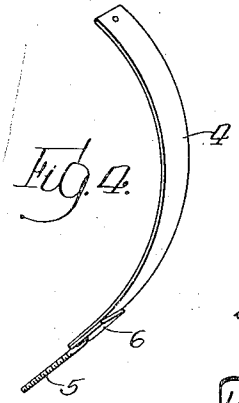
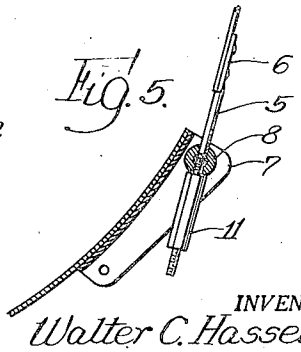


Fig. 5.



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BOMB BAND ASSEMBLY

Filed Aug. 5, 1943 4 Sheets-Sheet 2

Fig. 6.

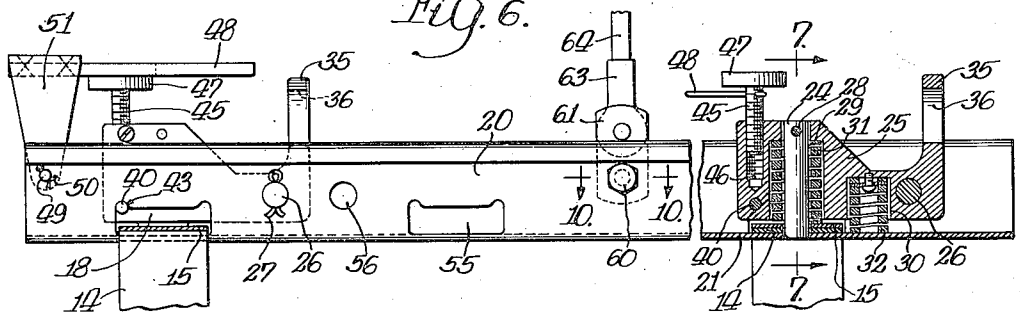


Fig. 7.

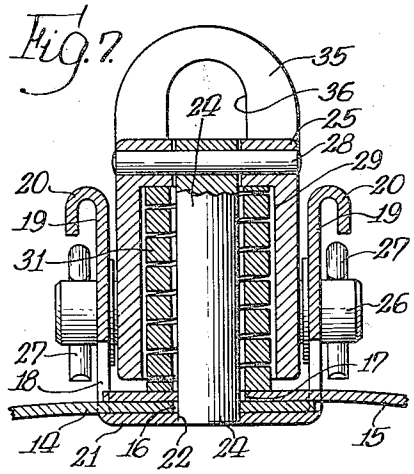


Fig. 8.

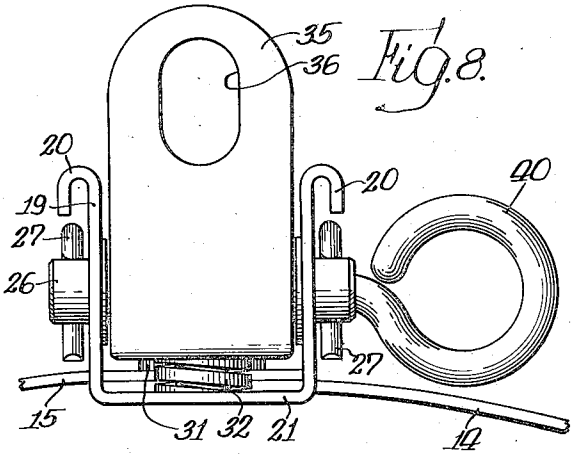


Fig. 9.

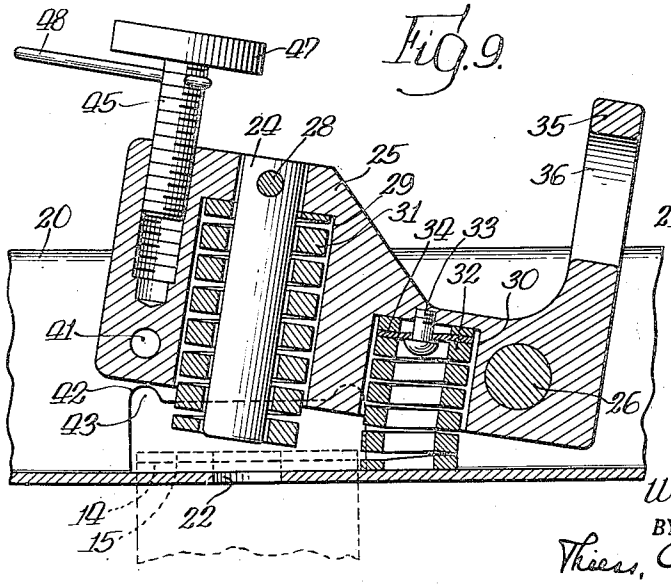
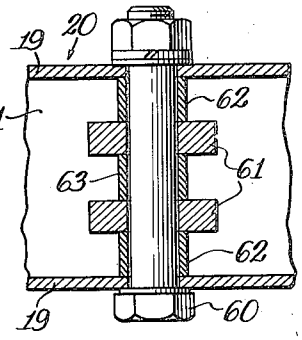


Fig. 10.



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BOMB BAND ASSEMBLY

Filed Aug. 5, 1943 4 Sheets-Sheet 3

Fig. 11.

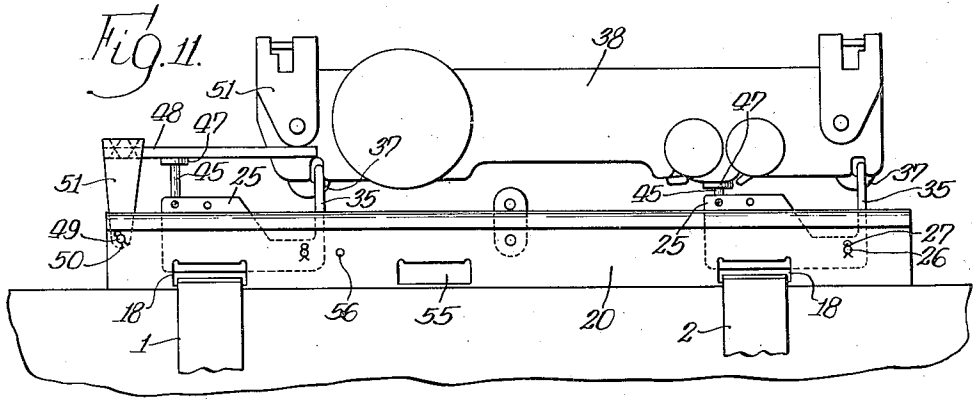


Fig. 12.

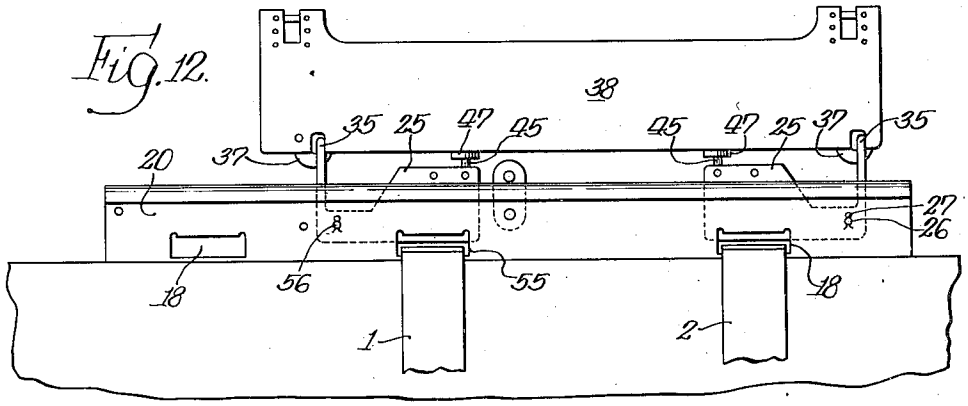


Fig. 13.

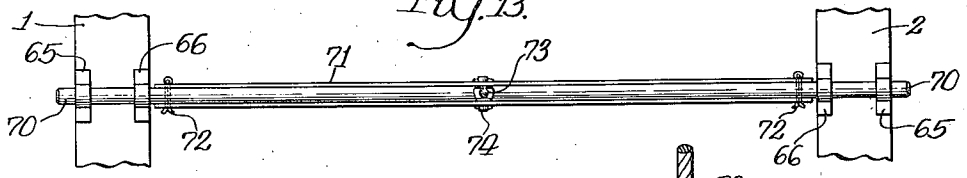


Fig. 14.

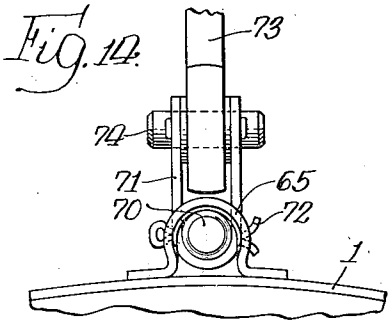
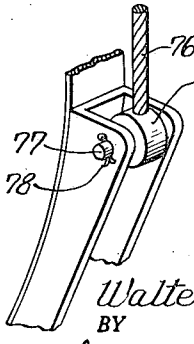


Fig. 15.



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BOMB BAND ASSEMBLY

Filed Aug. 5, 1943 4 Sheets-Sheet 4

Fig. 16.

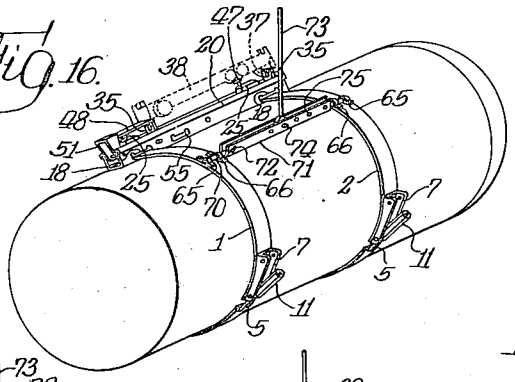


Fig. 17.

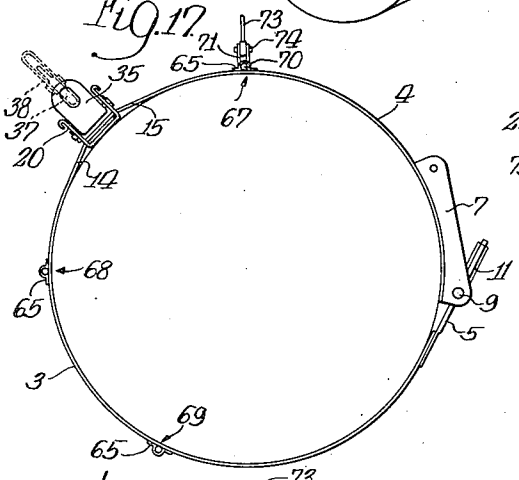


Fig. 18.

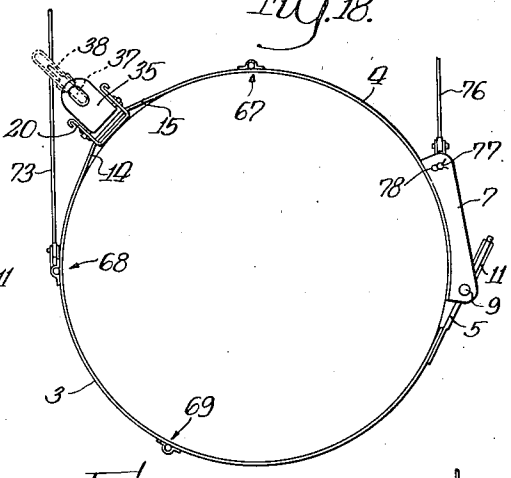


Fig. 19.

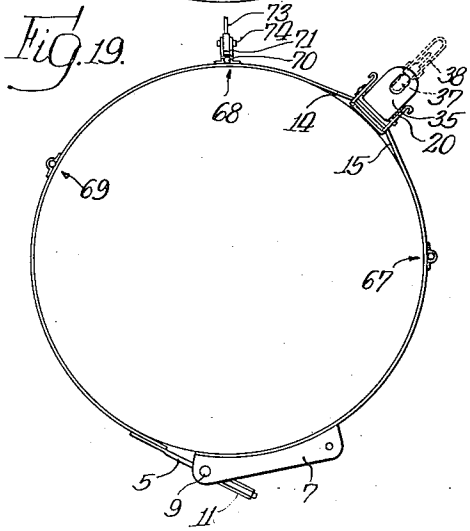
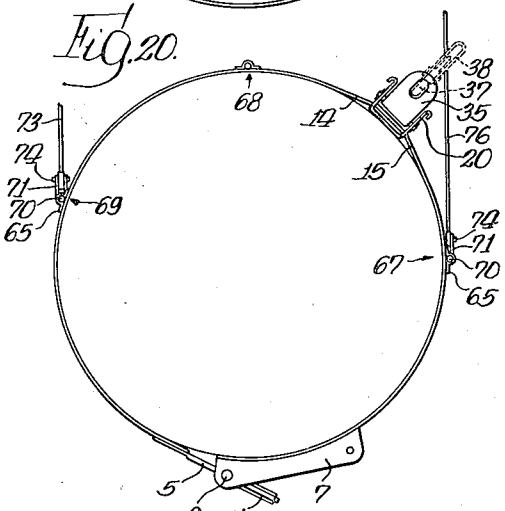


Fig. 20.



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Patented Feb. 22, 1949

2,462,744

UNITED STATES PATENT OFFICE

2,462,744

BOMB BAND ASSEMBLY

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Application August 5, 1943, Serial No. 497,427

25 Claims. (Cl. 89—1.5)

1

This invention relates to apparatus for use in attaching various types of aerial bombs, torpedoes, smoke tanks, depth charges, mines, incendiaries, and all other types of projectiles where suspension lugs are not, or cannot be, attached (due to their construction, excessive weight, effect on lugs on the trajectory path or directional deflection in air or water, or effect on steering of directional controlled projectiles) to the shackle or rack in bomb bays and under the wing sections of different types of aircraft or airships, or wherever they may be used advantageously.

The invention particularly contemplates a structure that will suspend any type of projectile such as a torpedo or a bomb load, or even a cargo load, and be releasable not only from the shackle or rack suspension carrying same, but also from the projectile whereby this structure will be expendible and fall free of the projectile, and the projectile will descend free of the structure or of any of the parts effecting its said suspension.

Various mechanisms for hoisting and for releasably suspending aerial missiles upon racks and shackles in bomb bays and elsewhere have been proposed. One of the difficulties encountered in the use of these prior devices resided in the fact that trunnions and mounting lugs had to be provided upon the missiles, and that, in actual combat, such protuberances resulted in a deflection of the missiles in their descent and in a serious loss through failure to accomplish the mission assigned. Wind deflection may properly be calculated and allowances made therefor, but protuberances often cause a deflection that seriously affects these calculations. Aerial suspension has been a real problem for consideration due to the limited space under the wings and in bomb bays of many types of airplanes. Likewise, the pattern of the load to be carried and the different weights and types of bombs to be loaded must be considered. Speed also becomes an essential point of consideration because loading often occurs between aerial operations of the planes or during refueling and when little time is given, as when alarms are sounded and the planes must be conditioned as quickly as possible. The loss of time is a serious matter, and consequently, the desideratum has been for lugs or trunnions on the missiles that would facilitate loading in order to satisfy a belief that the missile itself must be directly suspended upon or carried by the rack or shackle.

The invention is directed to providing an improved structure that may be used to eliminate suspension lugs, trunnions and like protuberances

2

on projectiles such as torpedoes, aerial bombs, or the like, or at least the parts effecting the suspension of projectiles, so that projectiles may be used that are completely streamlined and devoid, if so desired, of any protuberances that will cause wind deflection in their descent. A suspension for aerial projectiles is thereby provided that does not require the projectiles to be carried by the racks or shackles directly, the suspension structure preferably being expendible, when released, so as to allow the projectiles to descend without obstruction or interference.

A further object of the invention is to provide a simple and efficient structure for accomplishing this purpose. The structure is relatively inexpensive and may therefore be expendible with the projectile in order that the projectile may be allowed to descend unhampered after it has been accurately directed against its objective. The projectiles are suspended from the racks or shackles by this structure and are instantly released from the structure when the latter is released by the racks or shackles. Consequently, the release of the projectile may be controlled without loss of accuracy. Moreover, the arrangement of the parts of the structure carrying the bombs or other missiles results in a quick separation and the freeing of the bombs from these parts. The results sought are thus accomplished by making the structure suspending the projectiles upon the racks or shackles expendible and allowing the loss of this structure each time a bomb is released.

A still further object of the invention is to provide improved apparatus of the character disclosed embodying what may be termed a keel member preferably, although not necessarily, reinforced or otherwise strengthened to suspend the weight of the load and to keep the load tightly held thereagainst by circumferential straps or bands encircling the load, said straps being of a type that permits adjustment circumferentially about the load and of quick and easy application. Mechanism specifically illustrated herein in the form of spring pressed trigger devices and illustrative therefore as one possible embodiment of the invention may be associated with these parts to release the straps or bands from the keel the moment the suspension lugs are dropped from the bomb rack or shackle, these spring pressed triggers being normally restrained against operation as long as the weight of the projectile load is carried by the suspension lugs and the latter are in place upon the bomb rack or shackle.

A still further object of the invention is to pro-

vide an improved structure of the character disclosed that may be mounted upon the projectiles and conditioned at the same time to render the release mechanism inoperative and kept in this condition until after the projectiles are loaded in the bomb bays upon the rack or shackle and the weight of the projectiles is placed upon the suspension lugs. Thus, the structure may be easily and readily assembled about the projectiles in advance of being loaded upon the ships whereby projectiles with suspension structures of the type disclosed herein may be held for quick loading in the case of an emergency.

Another important feature is that the structure disclosed herein is capable of universal use upon any known type of bomb or missile for loading any design or type of plane or ship.

The employment of structure embodying the present invention novelly permits attaining the important feature of economy because this structure universally fits all types of bombs or missiles and may be used to load the same on all designs and styles of ships. Accordingly, different sizes and styles of loading equipment need not be carried in stock and the investment in material on hand will be reduced.

The invention also has particular value as applied to torpedoes because it will permit the elimination of protuberances that heretofore affected their path of travel through the water.

Other objects and advantages of the invention will be readily apparent from the following detail description when taken in connection with the accompanying drawings which form a part hereof.

In the drawings:

Figure 1 is a view of a bomb in descent and illustrating the feature of expendibility of the structure suspending the bomb or other missile carried thereby;

Fig. 2 is an enlarged view of a suspension structure embodying the present invention about a bomb;

Figs. 3 and 4 are perspective views of the band sections that may be employed;

Fig. 5 is a detail section view of the adjustment employed at the lower end of the band sections shown in the previous views;

Fig. 6 is an enlarged detail view, partly in elevation and partly in section, of a keel member and the release mechanism carried thereby to illustrate the manner in which the ends of the bands and the keel are locked together and the release mechanism rendered inoperative by the use of a safety pin, which is removable only after the load of the bomb is placed on the suspension lugs when the suspension lugs are hooked onto the bomb rack or shackle;

Fig. 7 is an enlarged detail section taken along line 7—7 of Fig. 6;

Fig. 8 is a view of the right hand end of the structure as shown in Fig. 6;

Fig. 9 illustrates the action of the spring pressed trigger release when the suspension lug is devoid of load weight and the safety pin has been removed;

Fig. 10 is an enlarged transverse section to illustrate the manner of mounting the bolt adapted to receive the hoist cable fitting for a central single cable hoist;

Fig. 11 illustrates one of the ways for attaching the structure herein disclosed to a bomb rack or shackle and securing the rack retainer plate at one end and an extension therefor at the other end to keep the missile from swaying, and therefore, without interfering with the release of the structure and bomb from the bomb rack when actuated;

Fig. 12 illustrates another way for attaching the structure to a bomb rack or shackle of a slightly different construction;

Fig. 13 is a top plan view of the U bracket removably carried by a rod extending across the bands that encircle the bomb to accommodate a cable fitting during the hoisting of the bomb;

Fig. 14 is an enlarged end view of the parts shown in Fig. 13;

Fig. 15 is a detail perspective of another form of connection for one of the cable fittings when double cable hoisting is used;

Fig. 16 is a perspective view of a missile or bomb held by the cable while it is being latched to the bomb rack or shackle and the rack retainer plate at one end and the extension thereof at the other end are adjusted to prevent swaying of the hoist;

Fig. 17 illustrates a simple cable hoist with the shackle on the port side;

Fig. 18 illustrates a double cable hoist with the shackle also on the port side;

Fig. 19 illustrates a single cable hoist with the shackle on the starboard side; and

Fig. 20 illustrates a double cable hoist with the shackle also on the starboard side.

As illustrated in the drawings showing one of a number of possible embodiments of the invention, a suspended band assembly carrying any type of missile or aerial bomb suspended from a bomb rack or shackle or wherever it is desirable to mount the same for release, comprises a number of bands 1 and 2 each in the form of two sections 3 and 4 adapted to be positioned circumferentially about the missile with their lower ends provided with fixtures for an adjustable take-up device in the form of a threaded bolt 5 welded or otherwise secured at 6 to say band section 4, and a U-shaped bracket 7 also welded or otherwise secured to band section 3. A block 8 having laterally extending end studs 9 and an aperture 10 may be mounted in the end of bracket 7, as shown in Fig. 3, and threaded bolt 5 may be inserted in aperture 10 and receive nut 11 threaded as shown in Fig. 5 to draw the band sections 3 and 4 together about the missile.

Band sections 3 and 4 may be of spring metal, if so desired, and have their free ends 14 and 15 overlap with apertures 16 and 17 that align with each other when the bands are drawn tightly about the missile. These free ends of the bands overlap, however, by passing through openings 18 in the side walls 19 of a channel-shaped member 20, which is termed herein as a keel. The base 21 of keel 20 is adapted to be positioned to lie against the bomb in a longitudinal direction with an aperture 22 in alignment with apertures 16 and 17.

To connect the bands 1 and 2 to keel 20, locking pins 24 are adapted to project into apertures 16, 17 and 22 and be held therein by pivotally mounted triggers 25, each being carried upon pins 26 riding in sides 19 of keel 20 and removably held by cotter pins 27. Each pin 24 is fastened to its respective trigger 25 by a cross pin 28. Triggers 25 may be in the form of pivoted blocks having two chambers 29 and 30 in which stripper springs 31 and opening spring 32 are disposed. Stripper springs 31 surround pins 24 and function to lift these pins 24 out of apertures 16, 17

and 22. Opening springs 30 function to swing triggers 25 about their pivots 26 to the position shown in Fig. 9. The upper end of stripper springs 31 may be connected to the triggers 25 in any suitable way. The opening springs 32 are adapted to be secured to the triggers in the upper part of chamber 30 by screws 33 and plates 34 which are inserted below the top convolution of each spring.

Each trigger 25 terminates at the opposite side of its pivot 26 in a suspension lug 35 having an opening 36 therein. Lugs 35 are adapted to be mounted upon the rack hooks 37 of a bomb rack or shackle 38. Hooks 37 will then latch closed as shown in Fig. 11 securely to carry these suspension lugs 35 without allowing them to slip therefrom. In this relation, the weight of the bomb is carried by suspension lugs 35 with the result that springs 31 or 32 are ineffective to urge triggers 25 to the position shown in Fig. 9. The mounting of the bomb in suspended relation and the consequent carrying of the weight of the bomb upon suspension lugs 35 are relied upon in the instant embodiment of the invention to hold the triggers in position to keep locking pins 24 in aligned apertures 16 and 17 of the overlapping ends of the bands 1 and 2 and in aperture 22 of the keel 20. To prevent the triggers 25 from being swung into releasing position and the locking pins 24 from being swung from out of these apertures 16, 17 and 22 before the assembly is mounted upon rack hooks 37, safety pins 40 are adapted to be inserted in openings 18 in sides 19 of keel 20. These safety pins are adapted to lie in holes 41 bored through the bodies of triggers 25 on the side opposite springs 31 and 32. These safety pins 40 are designed to remain extended beyond holes 41 and abut against the upper edge 42 of openings 18. Openings 18 are preferably notched as indicated at 43 to receive these safety pins 40 and keep them from accidentally shifting. However, springs 31 and 32 tend to tilt triggers 25 about their pivots 26 in a clockwise direction, which, in turn, acts to keep these safety pins 40 pressed tightly in notches 43 against edges 42. Pins 40 may be provided in the form of keys or the like that are easy to handle through the provision of rings at one end which may be gripped when the pins 40 are handled for insertion or removal.

Safety pins 40 are preferably inserted to lock triggers 25 in a position holding pins 24 in aligned apertures 16, 17 and 22 at the time the suspension band assembly is mounted about the missile. These safety pins are allowed to remain inserted until after the missile is loaded upon the rack or shackle hooks and the latter are latched closed. The weight of the assembly and bomb will then be carried by suspension lugs 35 so as to permit safety pins 40 to be removed. They should of course be removed prior to the take-off of the ship, but, in the event this does not happen, the missile will be dropped from the bomb rack or shackle when it is actuated and caused to head for the target in its descent, but the wind deflection caused by the keel 20 and the other parts will divert its intended travel.

It is also desirable to prevent swaying of the missile after it is suspended in position by the lugs 35 being placed upon hooks 37. This may be accomplished in the rather simple and expeditious manner of providing rack retainer screws 45 that thread into openings 46 in triggers 25 and carry at their upper ends plates 47 which may be brought to bear against the underside of the rack or shackle. A wire-like key 48, which also might be an ordinary nail, is inserted in an opening in the upper part of the rack retainer screws 45 just under plates 47 and the screws 45 are then raised until the plates 47 bear in the manner stated against the rack or shackle. By thus providing a two point contact for each trigger 25, a firm support is provided that will keep the missiles from swaying. It will be remembered, of course, that any binding action of plates 47 against the under side of the rack or shackle will not affect the release of the missile when the hooks 37 are unlatched and the suspension lugs 35 are allowed to slide therefrom. As soon as the lugs 35 clear the hooks 37, the weight of the missile is no longer upon the lugs and the springs 31 and 32 will flip the triggers 25 clockwise and lift the locking pins 24 out of aligned apertures 16, 17 and 22. Hence, the rack retaining plates 47 will not interfere at the time of release, but will serve their function to prevent any swaying of the missiles prior to the release.

In the event plates 47 fail to bear against the under side of the rack or shackle, as in the case of the left-hand plate 47 as shown in Fig. 11, due to the fact that the rack or shackle fails to extend far enough to the rear to lie over the plate, an extension 48 may be carried upon this left-hand plate through a U-bracket 51 fixed to the extension and extending downwardly on opposite sides so as to be carried by a rod 49 lying in the sides 19 or keel 20 and held by cotter pins 50. The extension 48 will then abut against any suitable part of the rack or shackle, as indicated at 51.

The racks and shackles vary according to the different types of planes used. Accordingly, openings 55, like openings 18, are provided in the side walls 19 of keel 20, preferably between openings 18, so that when a rack or shackle of the type shown in Fig. 12 is encountered, the left-hand band 1 may be moved to the right and the trigger 25 may be reversed in position and pivoted at 56 instead of 26 in order that the free ends of band 1 may be connected to keel 20 at the point of openings 55. The action of this trigger 25 in reversed position is identical to that heretofore described. The extension 48 of rack retainer plate 47 may be eliminated because plate 47 will bear directly against the underside of the rack or shackle. It will be apparent, therefore, that the structure disclosed herein is susceptible of changes without departing from the invention.

Figs. 13 to 20, inclusive, illustrate various ways that may be employed to hoist the bomb in position for attaching the band assembly in suspended relation upon the latch hooks 37 of the rack or shackle. When it is desired, however, to use a single hoist as where the rack or shackle is to be mounted directly above the bomb, a bolt 60 is inserted in and carried by sides 19 of keel 20 with links 61 disposed therein in spaced relation by spacers 62. Links 61 are then adapted to receive a fitting 63 carried by cable 64, as shown in Fig. 6, the cable then being lifted by the usual hoisting means employed for the purpose.

To accommodate all methods of hoisting necessarily employed due to the location of the rack or shackle in the bomb bays of various types of airplanes and also to the kinds of missiles loaded, a plurality of bearing straps 65 and 66 (Figs. 13 and 16) may be provided at different points about bands 1 and 2, these points being designated say at 67, 68 and 69 generally, or elsewhere, as indicated in Figs. 17 to 20, inclusive. These bearing

straps 65 and 66 need not be large but may be so disposed or located upon the bands and fixed thereto, as by welding or other suitable means, that they will conveniently receive the ends of hoisting bars 70 that are slipped endwise thereinto with a hosting plate 71 of channel shape held thereby, the bars and plates being provided with openings through which cotter pins 72 may be inserted to hold the parts together. These openings may be provided anywhere along the bars and plates, but as illustrated in Fig. 16, they are preferably provided at the ends of the bars where they may be easily removed and the bars and plates removed after the bombs are latched to the rack or shackle hooks 37. Figs. 16 and 17 illustrate somewhat diagrammatically the manner of hoisting a bomb and latching the same to a rack or shackle mounted on the port side of a bomb bay. In these views, the bomb has been latched in position and the cotter pins 72 are about to be removed to withdraw the hoist plate 71 and the hoist bar 70.

The cable 73 may be attached anywhere between the sides of plate 71 by a suitable pin 74 adapted to be accommodated in any one of a number of openings 25 provided in the sides.

Fig. 18 illustrates how a double hoist may be used to load the bomb upon the rack or shackle when disposed in the port side of the bomb bay. Instead of connecting hoist bar 70 and hoist plate 71 to the bearing straps 65 and 66 and at the point 67, they are connected to the bearing straps 65 and 66 at the point 68 so that the cable 73 is to the left of the rack or shackle. A second cable 76 is then connected to the upper end of bracket 7, which receives as previously explained the take-up bolt 5 and nut 11 at the lower end when bands 1 and 2 are mounted circumferentially about the missile. This upper end of bracket 7 is provided with opposed holes in the sides of the bracket to receive a pin 77 locked in position by cotter pins 78 (see Fig. 15). Pin 77 carries a fixture 79 at the end of cable 76. By placing the connection of cable 76 above the athwartship's center of the missile instead of directly opposite the connection of cable 73 at the point 68 on the horizontal center, any tendency of the missile to spin about its longitudinal axis during hoisting is prevented.

Fig. 19 illustrates a single cable hoist for the missile when the rack or shackle is mounted on the starboard side of the bomb bay. The hoisting bar 70 and the hoisting plate 71 are connected to bearing straps 65 and 66 mounted on bands 1 and 2 at the point 68 instead of 67 as above. In other respects the structure and the manner of handling the same may be the same.

When two cables are to be used to lift the missile with the rack or shackle disposed in the starboard side, two sets of hoisting bars 70 and hoisting plates 71 are used. These bars and plates are connected in the same manner to the bearing straps 65 and 66 disposed at the points 67 and 68. This form of suspension of the missile during hoisting is substantially the same as when the rack or shackle is disposed on the port side and two cables are used. The only difference is that the connection of cable 76 is at point 67 instead of the end of bracket 7.

From the foregoing description, it will be apparent that the invention is directed to a novel type of band assembly for suspending a missile from the latching hooks of a bomb rack or shackle, or other form of mounting that may be employed, so that, when these hooks are released, the assembly immediately breaks away from the bomb.

The bomb will descend entirely free of the assembly without interfering therewith or causing deflection by the wind. The manner in which this will occur has been illustrated roughly in Fig. 1, both bands 1 and 2 keel 20 with its parts dropping into space and thereby being expendible for each bomb that is released. It will be understood that the present structure does not prevent the use of protuberances upon the bombs when desired, but provides a means of releasably suspending bombs without requiring lugs to be provided upon the bombs for engaging hooks or other releasable elements upon which they may be mounted when loaded into position.

The structure is novelly designed to permit the band assembly to be placed about the bombs prior to the time the bombs are actually latched to the hooks of the racks or shackles. Safety devices in the form of removable pins 40 hold the triggers from flipping into their position disconnecting the bands from the keel. These pins may be removed after the bombs are hooked into position. The triggers will remain set due to the weight of the bombs then acting against the springs that tend to trip the triggers. As soon as this weight is removed from the triggers through the release of the suspension lugs from the rack or shackle hooks at the time the hooks are actuated to release the bombs, the springs will trip the triggers and the keel and bands will release themselves with a somewhat spring or snap action, particularly if the bands are made of spring metal. With the ends 14 and 15 released by being pulled free of keel 20, the bands 1 and 2 will withdraw from the bomb. The keel is then free of the band as well as the bomb and all the parts drop independently of each other.

Without further elaboration, the foregoing will so fully explain the gist of my invention that others may, by applying current knowledge, readily adapt the same for use under varying conditions of service, without eliminating certain features, which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to me by the following claims.

I claim:

1. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising means to embrace the missile, connecting means to which said embracing means is releasably connected, and means to release said connecting means from said embracing means whereby the parts including said embracing means and said connecting means are freed of the missile and each other and the missile is dropped free of said parts, said releasing means including a member responsive to the weight of the missile to prevent operation thereof until said member is intentionally relieved of said weight.

2. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising embracing means adapted to extend circumferentially about the missile, a substantially rigid structural element to which said embracing means is releasably connected, and trigger mechanism for holding said embracing means connected to said structural element, said trigger mechanism including a member respon-

sive to the weight of the missile to prevent release of said parts from each other while mounted in suspended relation but which will release the same when relieved of said weight.

3. Mounting apparatus for suspending an aerial missile or the like comprising a keel adapted to be positioned longitudinally along and in contact with the periphery of the missile, a flat spring metal band assembly extending circumferentially and tightly about the missile, means for connecting the ends of said band assembly to said keel, and means for attaching said keel in suspended relation, said attaching means including trigger means actuable upon release of said attaching means for releasing said connecting means whereby to free said band assembly, said keel and said missile and to drop said parts free of each other.

4. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising bands adapted to extend circumferentially about the missile, a keel, means to secure said bands to said keel, said means including releasable trigger mechanism having suspension lugs adapted to be releasably supported, and means to urge said lugs into trigger releasing position upon being freed from their suspended position.

5. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising a pair of bands adapted to extend circumferentially about the missile, a keel, means to secure both bands to said keel, and trigger mechanism tending to trip said securing means into releasing position, said trigger mechanism including suspension lugs adapted to restrain said trigger mechanism against such tripping action when the weight of the missile is carried by said suspension lugs.

6. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising a pair of bands adapted to extend circumferentially about the missile, a keel, means to attach both bands to said keel, trigger mechanism tending to trip said attaching means into releasing position, said trigger mechanism including suspension lugs adapted to restrain said trigger mechanism against such tripping action when the weight of the missile is carried by said suspension lugs, and removable means to lock said trigger mechanism against movement into releasing position independently of the action of said suspension lugs.

7. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising bands adapted to extend circumferentially about the missile, a keel, means to attach said bands to said keel, said means including a holding member for each band, a spring pressed trigger for each holding member, said triggers each having a lug-like suspension member, said triggers and said suspension members being so constructed and arranged as to cause said holding members to be retained in holding relation with said bands when the weight of the missile is carried by said suspension members.

8. Mounting apparatus for suspending an aerial missile or the like in a position for automatic release upon a target without any of the parts effecting its suspension remaining on or about its periphery while descending upon the target comprising bands adapted to extend circumferentially about the missile, a keel, means to attach said bands to said keel, said means including a pin for each band, a spring pressed trigger for each pin, a lug-like suspension member for each trigger, said triggers and said suspension members being so constructed and arranged as to cause said pins to secure said bands to said keel when the weight of the missile is carried by said suspension members.

9. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to extend circumferentially about the missile and have the free ends of each band overlap, said band ends being perforated and arranged to have the perforations align when said ends are overlapped, a keel or like member to which said bands are releasably connected, pins carried by said keel adapted to enter said aligned perforations to keep said band ends in overlapped relation and connected to said keel, and suspension lugs also carried by said keel, said lugs being mounted to carry the weight of the missile and connected to hold said pins in said aligned perforations and connected to said keel.

10. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to extend circumferentially about the missile and have the free ends of each band overlap, a keel or like members to which said bands are releasably connected, connecting pins movable into engagement with said bands and said keel to connect the same together, and pivotally mounted suspension lugs carried by said keel and operatively connected to said pins to remove the same from engagement with said bands to release the same.

11. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to extend circumferentially about the missile and have the free ends of each band overlap, a keel or like member to which said bands are releasably connected at said overlapping ends, movable pins adapted to enter aligned perforations in said overlapping ends and said keel, and pivotally mounted suspension lugs carried by said keel and operatively connected to said pins to withdraw the same from the preforations in said ends to release the same.

12. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to extend circumferentially about the missile and have the free end of each band overlap, a keel or like member to which said bands are releasably connected at said overlapping ends, and a plurality of pivotally mounted triggers carried by said keel, each trigger having a suspension lug and a locking member actuable by said trigger to releasably connect said bands to said keel.

13. Mounting apparatus for suspending an aerial missile or the like comprising bands of resilient spring metal adapted to be drawn circumferentially about the missile with the free end of each band overlapping, a keel to which said bands are releasably connected at said overlapping ends, pivotally mounted trigger mechanism including a suspension lug and a member operatively connected therewith and held in engaging rela-

tion with said overlapping band ends and said keel by the weight of the missile on said suspension lug, and spring means tending to pivot said trigger mechanism in a direction moving said member out of engaging relation with said overlapping band ends and said keel.

14. Mounting apparatus for suspending an aerial missile or the like comprising bands of resilient spring metal adapted to be drawn circumferentially about the missile, a keel, the free ends of each band adapted to overlap each other and at least to overlap a portion of said keel, said overlapping band ends and said overlapping portion of said keel having aligned perforations, and a spring pressed pivotally mounted trigger for each band, each trigger having a suspension lug and a locking pin movable into said aligned perforations of said overlapping band ends and said keel to lock the same together, the weight of said missile on said suspension lugs holding said pins in locking relation as long as said suspension lugs are held in their mounting positions and carry the weight of said missile, said spring pressed triggers including means for flipping said pins out of said locking relation to disconnect said bands and said keel from said missile when said suspension lugs are released from their said mounting positions and the weight of the missile is removed therefrom.

15. Mounting apparatus for suspending an aerial missile or the like comprising bands of resilient spring metal adapted to be drawn circumferentially about the missile, a keel of channel cross section adapted to be positioned with its base extending parallel to and longitudinally along the missile, said keel having openings in its side through which the ends of said bands are drawn to overlap each other and the base of said keel, trigger means carried by said keel having suspension lugs adapted to be hooked to a bomb rack or shackle, and means operated by said trigger means to hold said keel and said band ends in said overlapping relation while said suspension lugs remain hooked to said bomb rack or shackle, said trigger means including apparatus for tripping said means to release said band ends from said overlapping relation with each other and said keel when said suspension lugs are released from said bomb rack or shackle.

16. Mounting apparatus for suspending an aerial missile or the like comprising bands of resilient spring metal adapted to be drawn circumferentially about the missile, a keel of channel cross section adapted to be positioned with its base extending parallel to and longitudinally along the missile, said keel having openings in its sides through which the ends of said bands are drawn to overlap each other and the base of said keel, trigger means having suspension lugs adapted to be hooked to a bomb rack or shackle, means operated by said trigger means to hold said keel and said band ends in overlapping relation while said suspension lugs remain hooked to said bomb rack or shackle, said trigger means including apparatus for tripping said means to release said band ends from said keel when said suspension lugs are released from said bomb rack or shackle, and means for temporarily locking said trigger means against tripping said holding means.

17. Mounting apparatus for suspending an aerial missile or the like comprising bands of resilient spring metal adapted to be drawn circumferentially about the missile, a keel of channel cross section adapted to be positioned longitudinally along the missile, said keel having openings in its sides through which the ends of said bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, a locking pin insertible in said perforations to hold said parts releasably connected together, a trigger for each pin, said trigger being pivotally mounted upon said keel and having a suspension lug adapted to be hooked to a bomb rack or shackle, and spring means tending to urge each of said triggers to withdraw its said pin from said aligned perforations in said overlapping band ends and said keel whereby to free said bands and said keel from each other and said missile.

18. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to be drawn circumferentially about the missile, a keel adapted to be positioned longitudinally along the missile and having openings therein through which the ends of said bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, a locking pin insertible in said aligned perforation to hold said parts releasably connected together, a pivotally mounted spring pressed trigger tending to withdraw said locking pin from said aligned perforations, and a removable member for rendering said trigger inoperative.

19. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to be drawn circumferentially about the missile, a keel-like member adapted to be positioned against said missile with openings therein through which the ends of said bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, a locking pin insertible in said aligned perforations to hold said parts releasably connected together, and mechanism for releasing said pin whereby to separate said band ends and to withdraw them from said keel.

20. Mounting apparatus for suspending an aerial missile or the like comprising bands adapted to be drawn circumferentially about the missile, a keel-like member adapted to be positioned against said missile with openings therein through which the ends of said bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, a locking pin insertible in said aligned perforations to hold said parts releasably connected together, mechanism for releasing said pin whereby to separate said band ends and to withdraw them from said keel, and means for rendering said releasing mechanism inoperative.

21. Mounting apparatus for suspending an aerial missile or the like from a bomb rack or shackle comprising bands adapted to be drawn circumferentially about the missile, a keel-like member adapted to be positioned against said missile with openings therein through which the ends of the bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, locking pins insertible in said aligned perforations to hold said parts releasably connected together, pivotally mounted triggers for releasing said pins whereby to separate said band ends and to withdraw them from said keel, and suspension lugs extending from said triggers adapted to be hooked into said bomb rack or shackle to restrain said triggers from releasing said pins.

22. Mounting apparatus for suspending an ae-

rial missile or the like from a bomb rack or shackle comprising bands adapted to be drawn circumferentially about the missile, a keel-like member adapted to be positioned against said missile with openings therein through which the ends of the bands are drawn to overlap each other and the base of said keel, said band ends and said keel base having aligned perforations therein, locking pins insertible in said aligned perforations to hold said parts releasably connected together, pivotally mounted triggers for releasing said pins whereby to separate said band ends and to withdraw them from said keel, suspension lugs extending from said triggers adapted to be hooked into said bomb rack or shackle to restrain said triggers from releasing said pins, and an abutment on said triggers adapted to provide a second point of contact with said bomb rack or shackle for resisting any tendency of said suspension lugs to sway at its points of connection with said bomb rack or shackle.

23. Apparatus of the class described comprising a rack-like member for suspending a missile or the like in an air craft in position for automatic release upon a target, sustaining bands for encircling the missile and attaching it to the rack, the ends of each of said bands overlapping in the rack and having aligned apertures therethrough, locking pins carried by the rack to enter said apertures and lock the bands together and to the rack, and means carried by the rack to unlock said pins to permit the dropping of the bands and missile free of each other.

24. Apparatus of the class described comprising a rack member for suspending a missile or the like in an air craft in position for automatic release upon a target, sustaining bands for encircling the missile and attaching it to the rack, said rack being U-shaped in cross-section and adapted to be positioned with its base extending along the missile and having openings in its sides through which the ends of the bands are drawn to overlap each other and the base of the rack, said overlapping ends and base having aligned perforations therein, locking pins within the rack insertable in said perforations to hold said parts releasably together, and means to unlock said pins to drop the missile free of the bands.

25. Apparatus of the class described comprising a rack member for suspending a missile or the like in an air craft in position for automatic release upon a target, sustaining bands for encircling the missile and attaching it to the rack, said rack being U-shaped in cross-section and adapted to be positioned with its base extending along the missile and having openings in its sides through which the ends of the bands are drawn to overlap each other and the base of the rack, said overlapped ends and base having aligned perforations therein, a locking pin for each band within the rack and insertable in said perforations to hold said parts releasably together, a coiled spring surrounding each pin and compressed between the band ends and the end of the pin when the latter is in locking position, whereby when the pins are released the springs withdraw the pins to unlock the bands to drop them and the missile, and means under the control of the operator to release the pins from locking position when it is desired to drop the missile.

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Certificate of Correction

Patent No. 2,462,744. February 22, 1949.

WALTER C. HASSELHORN

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 7, line 75, before the word "immediately" insert *and the missile are freed and the assembly*;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of September, A. D. 1949.

[SEAL]

JOE E. DANIELS,
Assistant Commissioner of Patents.

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