

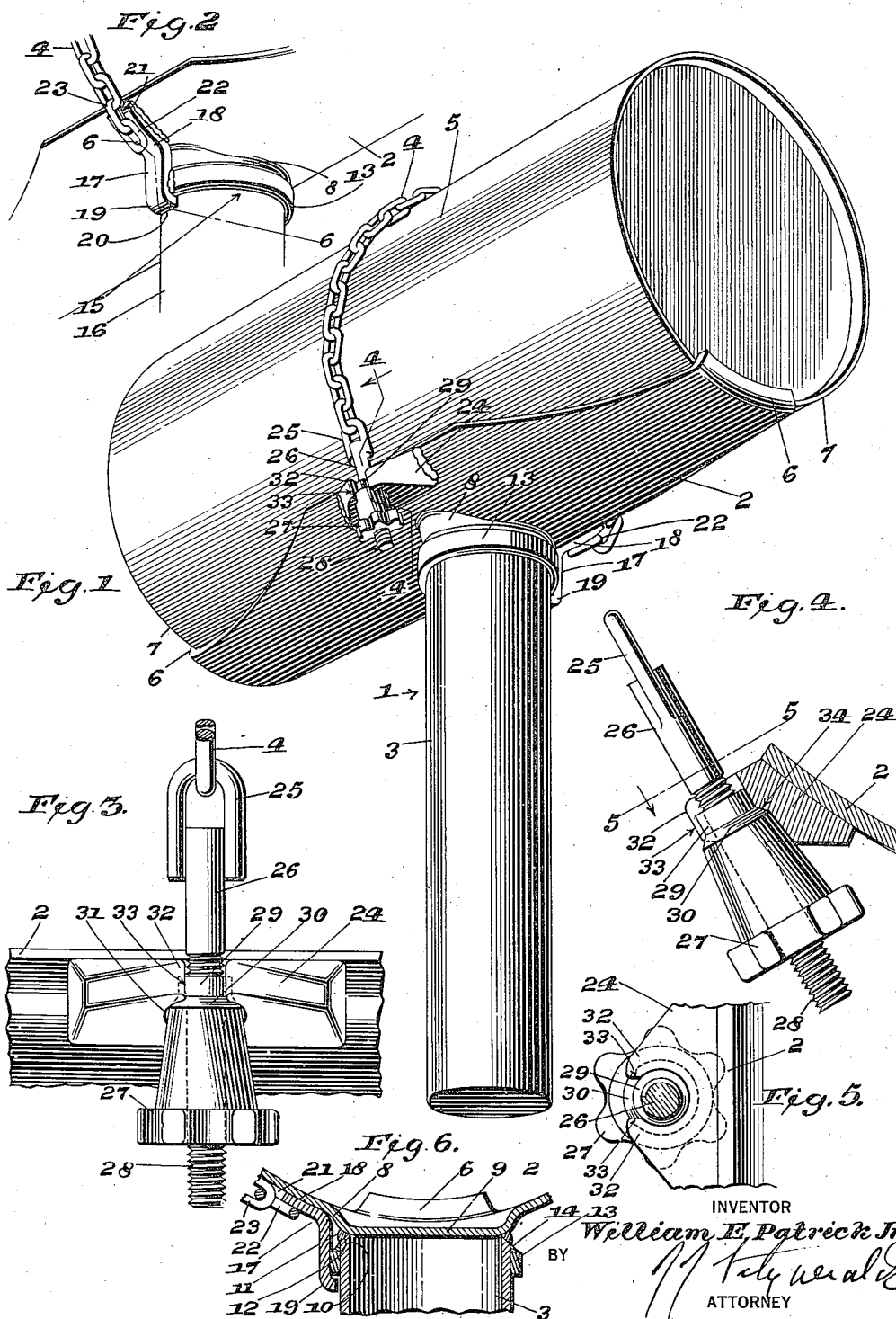
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DEPTH CHARGE ARBOR

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DEPTH CHARGE ARBOR

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5 Claims. (Cl. 102—7)

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This invention relates to improvements in ordnance, and more specifically, to an arbor for supporting an explosive container such as a depth charge, so that the depth charge may be projected from a gun. The purpose of projecting depth charges from guns is to increase the area over which they may be distributed in attacking an enemy vessel, thus supplementing the charges which are dropped from the release tracks mounted at the stern of the vessel.

Since the attachment of the depth charge to its arbor may, in general, be deferred to a time immediately prior to the actual use of the depth charge, the primary consideration herein is to enable the depth charge to be attached to its arbor in a simple and expeditious manner. To this end, a construction has been devised wherein it becomes readily possible, although not imperative, to insert the arbor stem into the barrel of the gun and thereupon lower the depth charge container upon the saddle or tray. An encircling chain or equivalent circumferential binder is then anchored by a quick manual operation, which operation does not involve the need or use of an auxiliary implement of any sort. With this preamble in mind the objects of the invention may be readily understood.

One object of this invention is to enable a depth charge container to be secured to its arbor in a simple and expeditious manner, so that the depth charge may be projected from a gun.

Another object of the invention is to enable the depth charge container to be secured to its arbor so that the binding pressure may be centralized to the girth of the container with respect to the arbor stem, and thereby afford a connection of maximum stability.

A further object of the invention is to enable the depth charge container to be secured to its arbor by a manual operation wherein it is unnecessary to utilize a wrench or equivalent auxiliary implement, which implement might, at a time of urgency, become lost or improperly handled.

Still another object is to provide an attaching means of the character stated which will maintain its anchorage and persist in its holding function even though inadvertently loosened to some extent.

A still further object is to prevent the arbor stem from turning in the gun barrel while placing the depth charge container in the tray and while tightening the securing means.

Yet another object of the invention is to embody a novel structural feature in the arbor by

means of which the necessity is avoided of specially shaping an end of the arbor to conform to the arcuate contour of the tray prior to making the connection.

5 Still further objects, advantages, and improvements will be apparent from the following description of the invention taken in connection with the accompanying drawing, of which:

Fig. 1 is a perspective view of an arbor constructed in accordance with the invention, a depth charge container being shown secured in place thereon.

Fig. 2 is a detail perspective view of a portion of the arbor, hereinafter referred to, in place in the barrel of a Y-gun.

Fig. 3 is an elevation illustrating the details of the chain securing means.

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 1.

Fig. 5 is a cross section taken on the line 5—5 of Fig. 4.

Fig. 6 is a detail cross section taken on the line 6—6 of Fig. 2.

In carrying out the invention the arbor, generally designated at 1, comprises the tray 2 and an integrally connected hollow stem 3, which is closed at its lower end. A chain 4, or a suitable flexible equivalent thereof, is permanently attached at one of its ends to a portion of the tray.

The tray 2 is arcuate in cross section in order to properly cradle the cylindrical container 5 of the depth charge. This depth charge consists of a high explosive as is commonly known, and neither it nor its detonator, per se, form any part of this invention. The tray 2 is as long as the container 5, and has integrally formed flanges 6 at each end thereof. These flanges prevent longitudinal displacement of the depth charge relative to the tray. At most, these flanges are lightly engageable by the chines 7 of the container and do not exercise any gripping function whatsoever.

A centrally situated boss 8 is formed on the convex side of the tray 2 during fabrication thereof. The bottom 9 of this boss is made flat and at right angles to the axis of the stem 3. These factors simplify the connection of the stem 3 to the tray. The end of the stem is cut square with respect to its axis and does not need to be specially shaped to fit the arcuate contour of the tray as would be the case if such boss were not provided. The aforesaid connection is made by welding at 11, the outer edge of the stem desirably being beveled at 12 to form part of a recess for the welding substance.

A collar 13 is welded at 14 onto the stem 3 adjacent to the end 10, and is adapted to rest upon the muzzle generally indicated at 15 (Figure 2) of a Y-gun barrel 16 when the stem is inserted thereinto. A chain anchoring strap 17 is welded both to the collar 13 and a part of the tray 2, for which latter purpose the strap includes an extension 18 which is shaped to fit the tray. A projection 19 at the outer end of the strap 17 underlies the collar 13 sufficiently far to insure its occupancy in a notch (Figure 2) in the muzzle 15. Said projection forms a temporary key which prevents the arbor stem 3 from turning in the gun barrel 16 while the container 5 is being placed in the tray 2.

The end of the extension 18 is slotted at 21 (Figure 6). A link 22 is welded onto the extension 18 so as to partly overlap the slot thereby making room for the first loose link 23 at one end of the chain 4. A bearing block 24, welded or otherwise made integral with that side of the tray 2 diametrically opposite from the strap 17, provides the anchorage for the other end of the chain. Said end is distinguished by a U-shaped link 25 (Figure 3) to which one end of an adjusting stud 26 is welded.

A securing nut 27 is carried by the threaded end 28 of the stud 26. Such nut includes a terminal collar 29 (Figure 4) which is of less diametral size than both the main body of the nut and its contiguous beveled annular shoulder 30. The collar 29 and shoulder 30 are adapted to loosely occupy a cavity 31 (Figure 3) in the front face of the bearing block. The collar 29 is intended to be confined in the cavity by lugs 32 which confront each other across an opening 33.

Said opening is large enough to admit the stud 26 when introduced thereto from the front of the bearing block, but too small to release the collar when the securing nut 27 is turned down. The lugs 32, therefore, confine the securing nut 27 at the collar 29, and from a brief inspection of Figure 4, it will be readily seen that such confinement will exist even though the securing nut may have a limited loose connection with its anchorage in the bearing block 24. The cavity 31 of the latter has a back wall formation 34 (Figure 4) to match the contour of the adjacent part of the nut 27. Said formation, therefore, provides a mount on which the nut 27 swings when turning it home on the stud 26 to tighten the chain 4. During this time the nut is held confined in the cavity 31 by the partial encirclement of the collar 29 by the confronting lugs 32.

One manner of assembling the arbor 1 and the depth charge container 5 is to insert the stem 3 into the bore of the gun barrel and then place the container 5 in the tray 2. Care should be taken to interconnect the projection 19 and notch 20 in the Y-gun barrel (Figure 2) so that the arbor will not be able to turn and thereby possibly drop the container. This method of assembling has the advantage of avoiding the necessity of lifting the total weight of the depth charge and arbor a distance in excess of the length of the stem 3 when loading the gun. Having inserted the stem 3 into the gun barrel and while still supporting the depth charge container from the hoisting device, the chain 4 is brought around and anchored at the bearing block 24. The chain is tightened by manually turning the nut 27. Since no tools of any kind are required for this purpose there is never any danger of the securing operation being interrupted, as would be the

situation if it was necessary to use a tool and the tool was lost or inexpertly used.

It will be observed that in the preferred embodiment the attaching means 4 is applied to the available girth of the container 5 in a place located centrally of the length of the container. The binding pressure is thus distributed throughout the entire circumference of the container and since the pressure is centralized over the adjacent end of the stem 3, it follows that the connection will be of maximum stability. The flanges 6 are merely limiting lugs in respect to the container 5, purposely avoiding a grip or interlock of any sort with the chine 7. Such a grip should not be relied upon to hold the depth charge container and arbor in connection, because the weight of the depth charge will tend to deform the flanges and thus open the possibility of the container falling away. A limited loosening of the instant attaching means 4 cannot have the same result since under no ordinary circumstance would the nut 27 be permitted to be so loose as to permit the escape of its collar 29 from the confines of the cavity 31.

A second method of assembling the depth charge container 5 and arbor 1 is to cradle the container in the tray 2 prior to introducing the stem 3 into the gun barrel. The chain 4 is applied and secured as previously described, whereupon the assemblage is hoisted high enough to permit dropping the stem 3 into the gun barrel.

While the invention has been described with reference to certain preferred examples thereof which give satisfactory results, it will be understood by those skilled in the art to which the invention pertains, after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is my intention, therefore, to cover in the appended claims all such changes and modifications.

The invention herein described may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A depth charge arbor having a stem adapted to be inserted in a gun barrel, a tray secured to one end of said stem, said tray being adapted to cradle a depth charge container, flexible attaching means adapted to embrace the container having one end connected to one side of the tray, a securing nut fixed to the other end of the flexible attaching means, a bearing block secured to the opposite side of the tray, said securing nut and said bearing block being interconnectible to produce a binding pressure of the attaching means and tray circumferentially of the container.

2. A depth charge arbor having a stem adapted to be inserted in a gun barrel, a tray secured to one end of said stem, said tray being adapted to cradle a depth charge container, flexible attaching means adapted to embrace the container having one end connected to one side of the tray, a securing nut fixed to the other end of the flexible attaching means, a bearing block secured to the opposite side of the tray, said securing nut and said bearing block being interconnectible to produce a binding pressure of the attaching means and tray circumferentially of the container, and means embodied in the securing nut

and bearing block allowing a limited looseness of the securing nut without allowing its disconnection from the bearing block.

3. A depth charge arbor having a stem adapted to be inserted in a gun barrel, a tray secured to one end of said stem, said tray being adapted to cradle a depth charge container, flexible attaching means connected at one of its ends to one side of the tray and adapted to be placed around the container, a stud carried by the other end of the flexible attaching means, a securing nut adjustable along said stud and terminating in a collar and shoulder of greater diametral size than the stud, a bearing block carried by the other side of the tray and having a cavity occupied by the collar and shoulder thereby to connect said other end of the attaching means to the tray, and a pair of lugs forming parts of the bearing block partially demarcating the cavity and being in confronting relationship to define an opening slightly wider than the stud but of less width than the collar and shoulder.

4. An arbor having a tray adapted to support a depth charge container and a stem secured to the tray adapted to be inserted in the barrel of a gun, flexible attaching means adapted to sur-

round said container and being connected at one of its ends to one side of the tray, and a strap to which the other end of said attaching means is connected, said strap being located on the other side of the tray and having a projection adapted to prevent turning of the stem when the stem is in the gun barrel.

5. A depth charge arbor having a stem adapted to be inserted in a gun barrel, a tray secured to one end of said stem, said tray being adapted to cradle a depth charge container and having flanges at its ends for limiting movement of the container, flexible attaching means adapted to engage the available girth of the container, one end of said means being fixedly connected to one side of the tray contiguously to and in line with the stem, and anchoring means for adjustably connecting the other end of said attaching means to the opposite side of the tray also contiguously to and in line with the stem, said anchoring means being operable to cause the tray and attaching means to exercise a circumferential binding pressure upon the container at a place medially of its ends.

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