

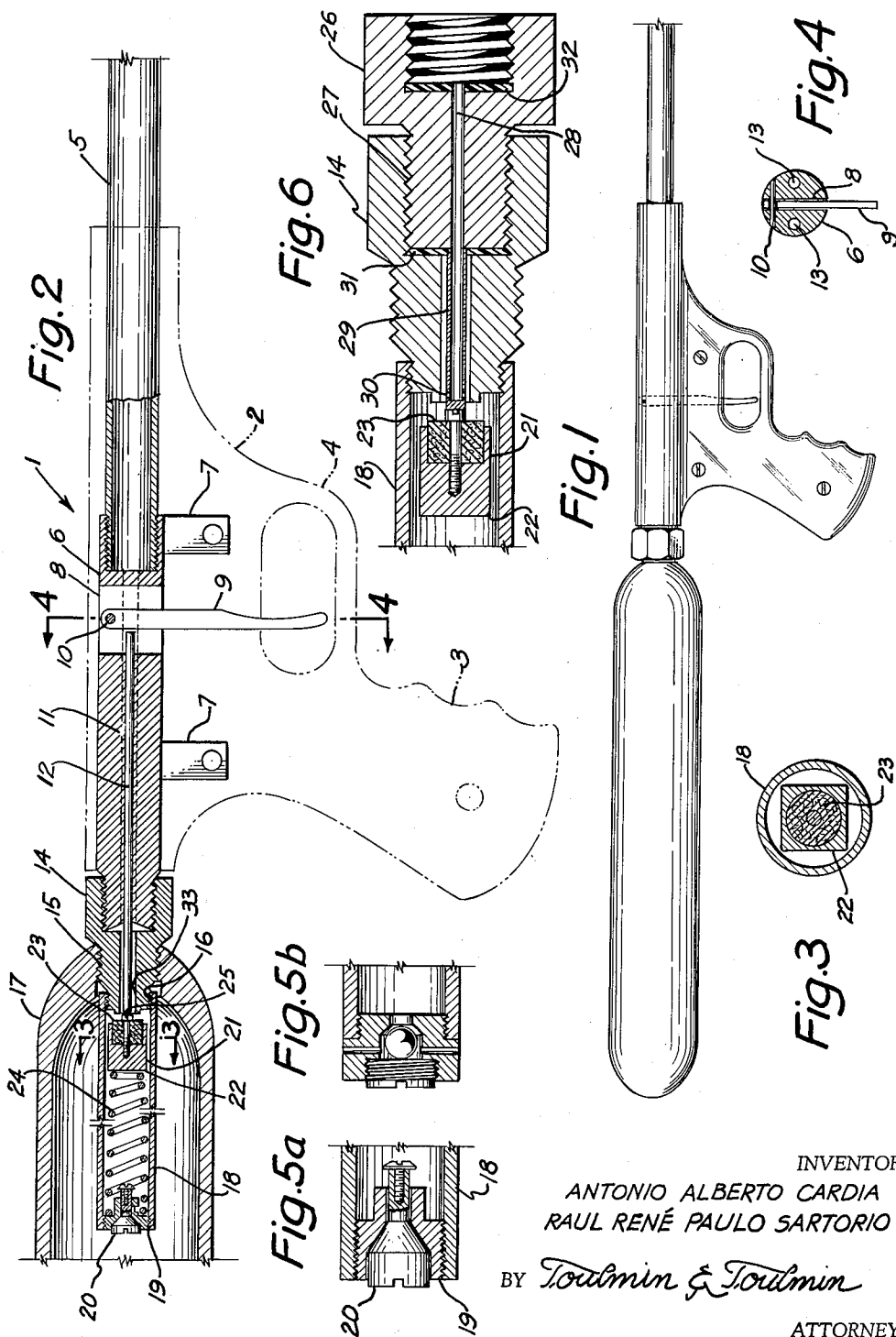
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SPEAR GUN

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SPEAR GUN

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1 Claim. (Cl. 124—11)

The present invention relates to a spear gun, more particularly to a spear gun having a rechargeable pressurized gas container detachably mounted at one end thereof with a shooting chamber also mounted on the same end of the gun and inside of the container for delivering predetermined charges of pressurized gas to the gun for propelling spears therefrom.

The so-called spear guns are primarily intended for use underwater by skin divers and the like and the spears are propelled from the guns by charges of high pressure gas. The source of high pressure gas is generally obtained from a chargeable container which is detachably mounted on the spear gun. A manual feed cock is usually provided for loading charges of the gas into the spear gun from the container. Each charge of gas is sufficient for propelling a single spear therefrom or for a single shot.

When using such a manually operated feed cock it is difficult to introduce the same amount of gas into a shooting chamber for each charge of gas. Accordingly, the charges of gas vary and the accuracy of the gun is impaired since the exact amount of compensation required is never known for the variable amounts of gas present for each shot.

In addition, the above arrangement is susceptible to many leakages since the pressure in the rechargeable container is usually greater or at least different from the pressure in the shooting chamber. These differences of pressure between these two compartments result in the leakage of gas therebetween. Accordingly, precautions must be taken to construct heavy and effective valves to prevent such leakages. Such constructions add to the weight and cost of the spear gun.

The present invention provides a spear gun which eliminates the above disadvantages and incorporates many additional advantages which are of great value to users of the gun. In the spear gun of this invention, the shooting chamber is mounted inside the rechargeable pressurized gas container. A cut-off or check valve is mounted in the end of the shooting chamber to permit the refilling of the container through the shooting chamber. When the container has been filled, the pressure of the gas therein will close the check valve in the shooting chamber. When the check valve is in the closed position, however, it is still slightly open to permit a very slow flow of gas into the shooting chamber. It is this slow flow of gas which introduces each charge of gas into the shooting chamber.

When it is desired to shoot a spear from a gun, the trigger is depressed and a suitable mechanism is provided to open a valve in the front of the shooting chamber to permit the discharge of the charge of gas therein into the barrel of the gun.

One advantage of the above construction is that many leakage problems are eliminated because of the same gas pressure both inside the shooting chamber and outside of the shooting chamber within the gas container. Further, there is no need of any manually operated feed cock for loading the shooting chamber and for maintaining the rechargeable container closed. The gas loading for each shot is accomplished automatically by the small flow of gas through the check valve positioned in the rear of the shooting chamber.

As another result of this arrangement there is only the same amount of gas present in the shooting chamber

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and accordingly, all of the charges of gas are equal. Further, there is virtually no waste of the pressurized gas when the trigger is kept depressed for a period longer than necessary. As soon as the charge of gas in the shooting chamber is evacuated the check valve in back thereof will prevent further gas flow in a large amount from the storage chamber into the shooting chamber. As pointed out previously, there will be only a small flow of gas from the container into the shooting chamber.

It is, therefore, the principal object of this invention to provide a novel and improved spear gun.

It is a further object of this invention to provide a spear gun from which spears are propelled by charges of pressurized gas but where leakage problems of the gas are largely eliminated.

It is an additional object of this invention to provide a spear gun wherein the charges of gas for each shot are substantially equal.

It is still another object of this invention to provide a multi-shot spear gun wherein the gas for each shot is automatically introduced to the shooting chamber after a shot has occurred.

Other objects and advantages of this invention will become apparent upon reference to the accompanying description when taken in conjunction with the following drawings, wherein:

FIG. 1 is a side elevational view of the spear gun of this invention;

FIG. 2 is a longitudinal sectional view of the spear gun as shown in FIG. 1, to show the details of the construction thereof;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken along the line 4—4 of FIG. 2;

FIGS. 5a and 5b show embodiments of the valve mounted in the back of the shooting chamber; and

FIG. 6 shows an intermediary adaptor for use in filling the rechargeable container.

Proceeding now to the drawings, more particularly to FIG. 1, wherein like reference symbols indicate the same parts throughout the various views, the spear gun of this invention is generally indicated at 1. The spear gun essentially comprises a stock 2 which has a conventional handle 3 and a trigger guard 4. The stock may be made of a high strength plastic, of wood, of metal, or any other suitable material.

Mounted on the upper portion of the stock is a hollow forward barrel portion 5 and a solid rear barrel portion 6. The forward barrel portion 5 is threaded into the forward end of the rear barrel portion 6 such as may be seen in FIG. 2, and brackets 7 are used to secure the rear barrel portion to the stock.

The rear barrel portion 6 has a slot 8 therein in which is pivotally mounted a trigger 9 at the pin 10. The trigger 9 extends into the trigger guard in a conventional manner.

The rear barrel portion 6 has an axial bore 11 in which is slidably mounted an actuating rod 12.

The rear barrel portion 6 also has a pair of gas passages 13 which may be seen in FIG. 4.

On the rear end of the rear barrel portion 6 there is threadedly mounted an adaptor 14. The adaptor 14 has a central threaded portion 15 and an end threaded portion 16 which is of a smaller diameter than the central portion 15. A rechargeable pressurized gas container 17 is threadedly mounted on the threaded portion 15. This chamber is conventional and may be filled with a gas such as carbon dioxide which is under a high pressure.

A shooting chamber 18 is mounted within the container 17 and is threaded upon the end threaded por-

tion 16 of the adaptor. The shooting chamber 18 has a back valve 19 which has a valve member 20 movably mounted therein. The valve is made of brass and is so constructed that when in its closed position as shown in FIG. 5a the valve is slightly open so as to permit a slow flow of gas from the container 17 into the shooting chamber 18.

At the forward end of the shooting chamber 18 there is positioned a discharge valve 21 which has a brass portion 22 and a nylon valve member 23. A spring 24 urges the valve 21 against the central opening 33 in the adaptor 14. The valve 21 is engageable by the end 25 of the actuating rod 12.

The adaptor 14 of the rear barrel portion 6 is preferably made of brass. The forward barrel portion 5 may be made of either brass or aluminum.

There is shown in FIG. 5b another type of valve which may be substituted for the back valve 19. The valve of FIG. 5b comprises a check valve having a spherical valve member therein. The spherical valve member may be made of brass, stainless steel or any other non-corrosive material. This check valve is similarly constructed so that when the spherical valve member is in the closed position the check valve is still slightly open.

Any other form of check valve in addition to those illustrated which is slightly open in the closed position can be used as the back valve for the shooting chamber.

When operating the spear gun it can be seen that depression of the trigger 9 by the finger will engage the forward end of the actuating rod 12. The actuating rod will be moved backwardly against the valve 21 and will move this valve member away from the central opening of the adaptor. This will permit the gas to flow from the shooting chamber through the adaptor and through the gas passages 13 into the forward barrel portion 5. Since the back valve when in the closed position is still somewhat open, a slow flow of gas will continue from the container into the shooting chamber. Upon release of the trigger 9 the valve 21 will close off the shooting chamber and gas will continue to slowly flow from the container into the shooting chamber to build up a charge of gas for the next shot.

In order to recharge container 17 an intermediary adaptor such as shown at 26 in FIG. 6 can be used. The adaptor 26 comprises a threaded portion 27 and has an axial passage 28 therethrough. When the container is to be charged from a large capacity gas tube a pin 29 is employed. The pin 29 has openings 30 near the end thereof. Insertion of the adaptor with the pin 29 into the adaptor 14 will open the shooting chamber by moving the valve 21 rearwardly. This will enable the gas to flow from the source into the shooting chamber and through the back valve into the container.

When the container is to be reloaded from a compressor the pin 29 is not necessary since the pressure of gas

from the compressor would be sufficient to move the valve 21 rearwardly and to provide a passage of gas into the shooting chamber and the container.

For better sealing purposes the adaptor 26 is provided with plastic gaskets 31 and 32 at both ends thereof.

Thus, it can be seen that the present invention discloses a spear gun which represents a substantial improvement in the art. The provision of the shooting chamber within the gas storage container eliminates many leakage problems and the use of the back valve in the shooting chamber enables the shooting chamber to be filled with equal charges of gas for each shot. Further, the presence of the back valve and the shooting chamber prevents the waste of gases should the trigger be held in the depressed position after the spear has been propelled from the barrel of the gun.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claim.

What is claimed is:

A spear gun comprising a stock having a handle thereon, a barrel mounted on said stock and said barrel comprising a forward hollow portion and a rear solid portion, there being passage means extending through said rear barrel portion, a rechargeable pressurized container mounted on the end of said rear barrel portion, a shooting chamber within said container and also mounted on the rear barrel portion, first valve means within said shooting chamber between said container and said shooting chamber and having an open position to admit a rapid flow of gas from said shooting chamber to said container and having a closed position which admits a slow flow of gas from said container to said shooting chamber, second valve means within said shooting chamber and spring biased to a closed position, a rod slidably mounted within said rear barrel portion with one end thereof engageable with said second valve means, and a trigger pivotally mounted within said rear barrel portion and engageable with said other end of said rod when depressed whereby said second valve means opens and admits a charge of high pressure gas into said forward barrel portion through said passage means.

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