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Ware

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[54] **WATER CANNON**

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[52] **U.S. Cl.**..... **222/79,** 222/340, 222/382, 222/383, 124/15, 124/37, 220/36, 220/41

[51] **Int. Cl.**..... **A63h 33/00**

[58] **Field of Search** ..... 222/79, 340, 341, 382, 222/383; 124/15, 37; 9/1 R, 311; 220/36, 41

[56] **References Cited**

UNITED STATES PATENTS

285,520	9/1883	Spawn	169/5
2,735,221	2/1956	Fields	124/37 X
2,771,906	11/1956	Bratfisch et al	220/36 X
2,785,562	3/1957	Tigerman	220/41
3,002,699	10/1961	Pinke	222/382 X
3,116,855	1/1964	Thomson	222/340 X
3,318,482	5/1967	Voce	222/79
3,372,412	3/1968	Robertson	9/311

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[57] **ABSTRACT**

A water cannon for use on land or in the water. Water inlets may be opened to fill the container and closed so that the container may be moved from the water source for use. Construction of the apparatus is such that it will float when used in a water environment. The design of a compression cylinder, barrel and nozzle is such that maximum distance may be achieved with a droplet size that will not be injurious to those who use the apparatus.

6 Claims, 4 Drawing Figures

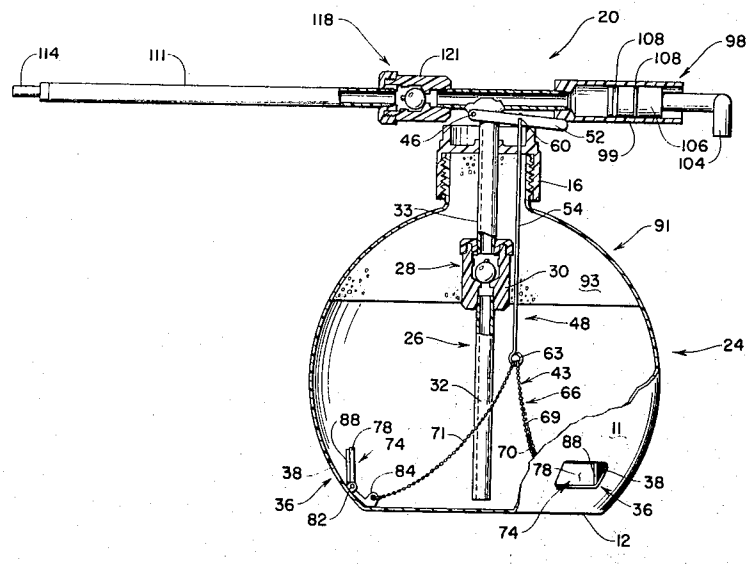


Fig. 1

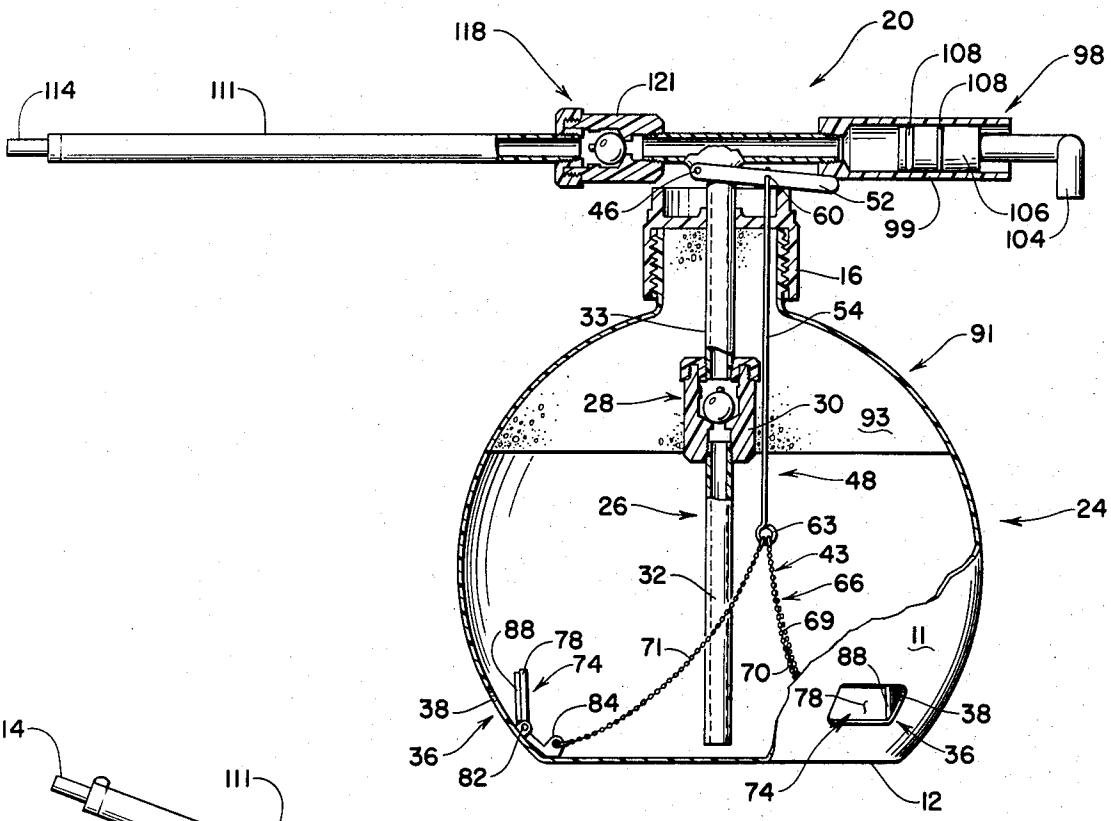
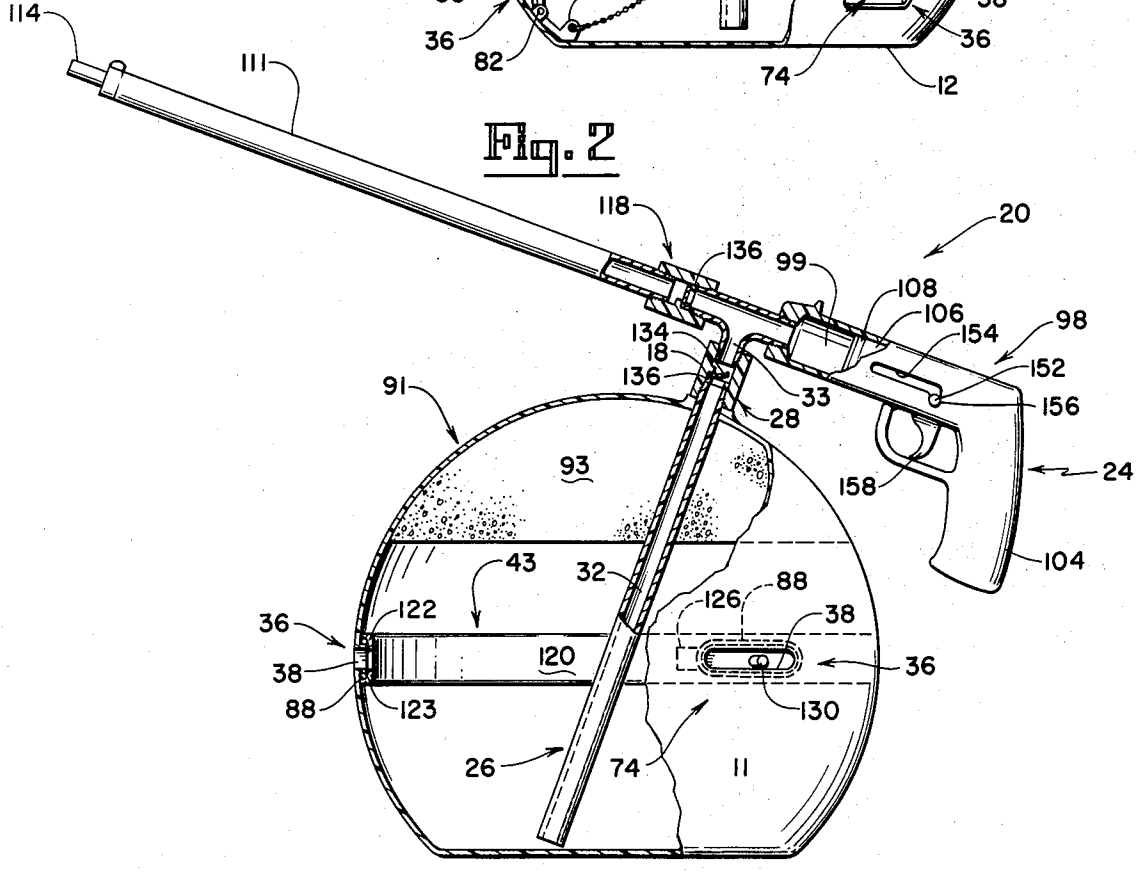

118
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114
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74
12

Fig. 2


114
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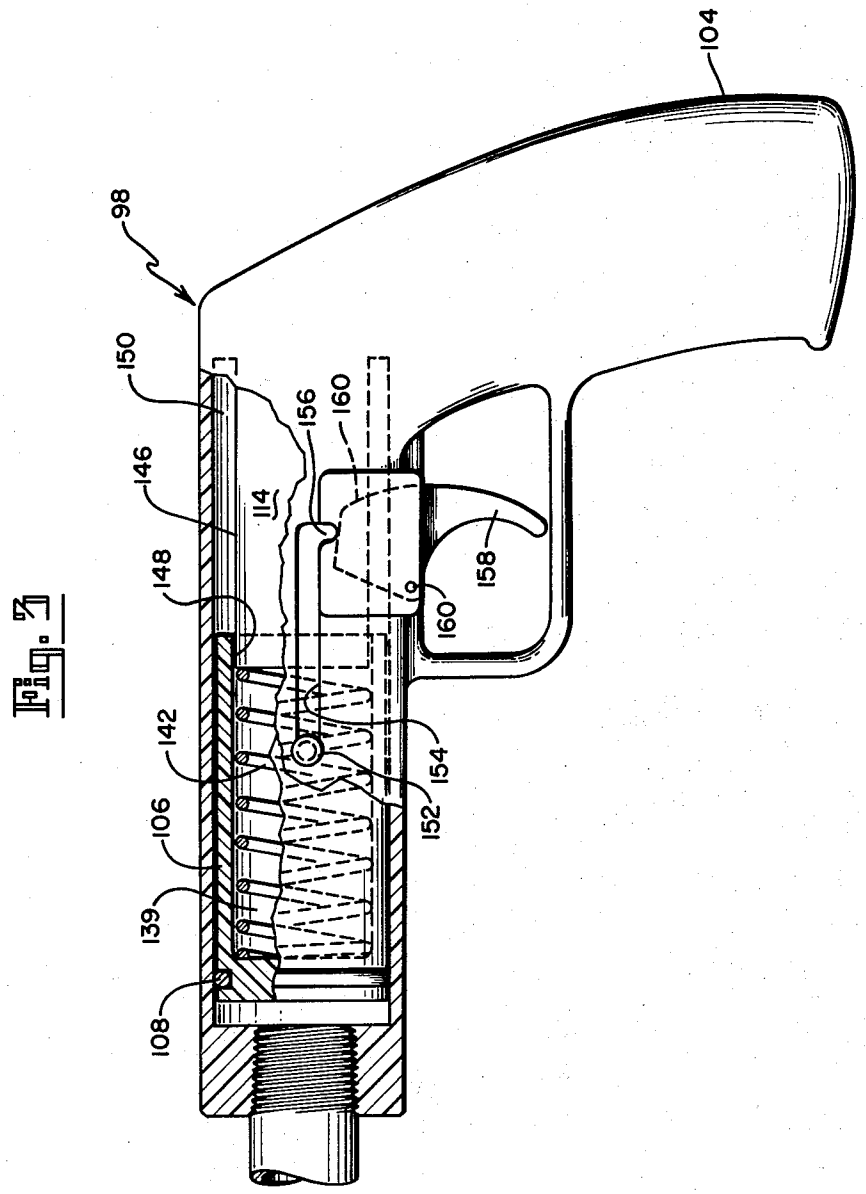


Fig. 2

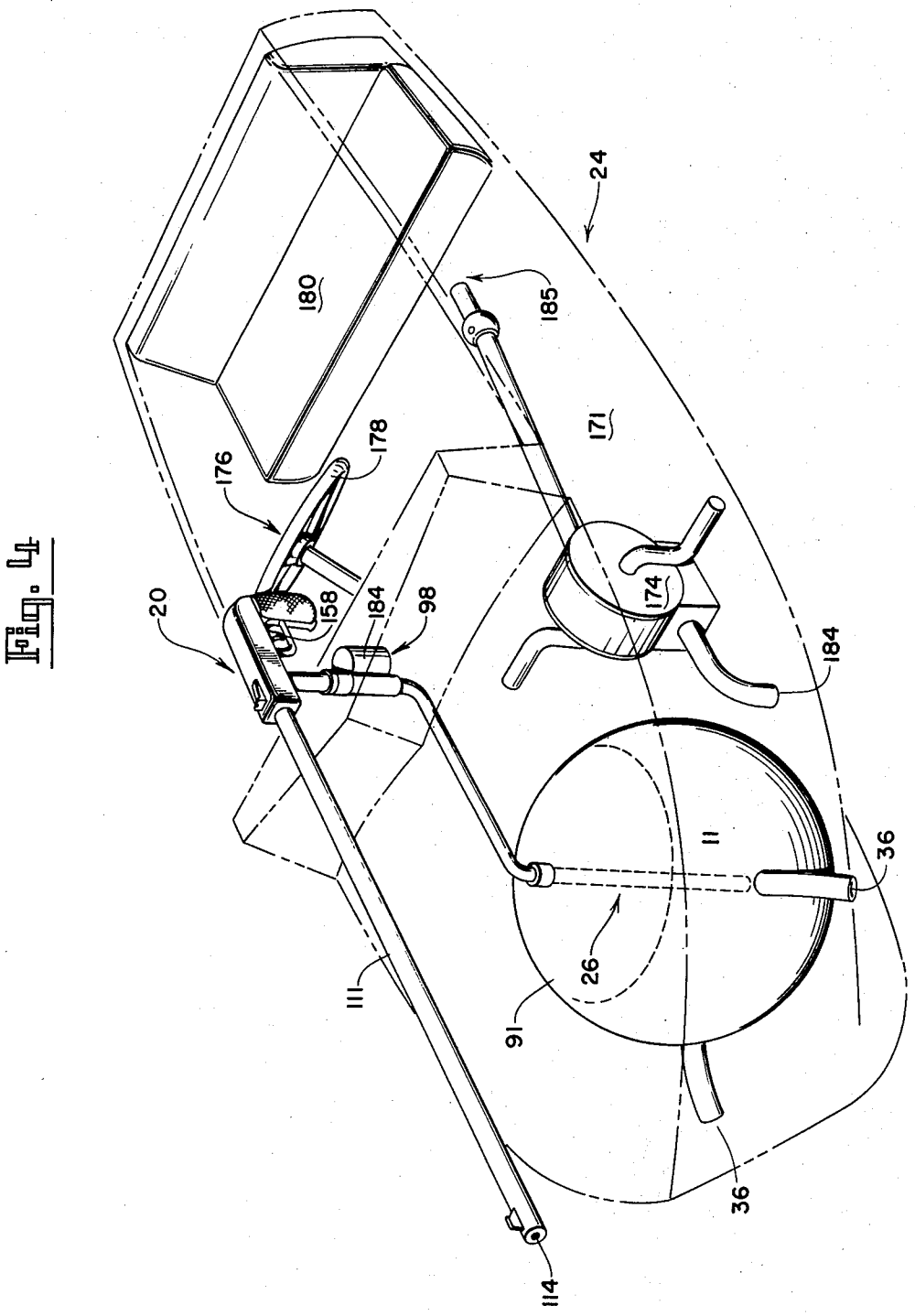


Fig. 4

WATER CANNON

BACKGROUND OF THE INVENTION

Various water dispensing guns have been proposed in the past with most being hand held and having a very limited water supply. Those types having a higher volume requiring an outside water source have been limited to use either on land or in the water. Some hand held guns are simply adaptations of conventional water guns with a water source remote from the gun. Others require elaborate back pack designs and complicated internal structure. Similarly, guns for use in the water in the past have utilized the pressurized water supply readily available and are generally characterized by complex structure.

SUMMARY OF THE INVENTION

Applicant's invention, on the other hand, is a simple, noncomplex water cannon which is readily adaptable for use either on the land or in the water. It utilizes simple hydraulic function in a precise design to assure a minimum of movable parts, repeated ease of operation and maximum safety to those in the vicinity of the user. The force expelling the water may be manual, spring actuated or electrically transduced. Provision is made to assure that the device will float when used in water and is stable when used on land. A plurality of water inlets may be provided for filling the container when used on land.

A final embodiment is shown which comprises a recreational vehicle which can be used on larger bodies of water.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view partly in section and partly broken away showing one embodiment of my invention;

FIG. **2** is a side elevational view partly in section and partly broken away showing a second embodiment of my invention;

FIG. **3** is an expanded elevational view partly broken away of the handle, trigger mechanism and spring loaded hydraulic cylinder of the embodiment shown in FIG. **2**; and

FIG. **4** shows a third embodiment of my invention which comprises a water cannon with a hull and motive means for use on the surface of the water.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Basically, the structure which is my invention may be used on the land, in the water, or on the water. Two embodiments for expelling water are shown in FIGS. **1** and **2.**

The apparatus comprises a container **11** which may be of any shape but is shown as a sphere. The bottom **12** of the sphere is flattened or leveled for stability when used on land.

Fixedly secured to the top **14** of the container such as by a threaded cap **16** or connection **18** is the gun portion **20** of my water cannon **24.** A suction inlet tube **26** is connected to the gun portion **20** and extends from the bottom **12** of the container **11** to the top. It includes a one-way valve **28** interposed at an intermediate position to assure flow from the bottom **12** of the container **11** to the gun **20** only. As shown in FIG. **1** the one-way valve **28** is a ball check valve **30** which is threadably secured to first and second portions, **32** and **33** respectively, of the inlet suction tube **26.**

Water inlet means **36** are located in the bottom portion of the container **11** to fill the container **11** for use on land. Although one inlet **36** is sufficient, a plurality of inlet apertures **38** are preferably circumferentially disposed around the periphery of the lower one-half of the container. It should also be understood, however, that for use solely on land no inlets **36** are necessary and water can be filled through the top of the container **11.**

Means **43** are also provided, as shown in FIG. **1,** to close the water inlet means **36** after the container **11** is filled prior to removing it from the water. The embodiment in FIG. **1** employs a connected lever assembly **48** which is pivotally **46** secured to the top portion **33** of the suction inlet tube **26.** At an intermediate point on the lever **52** a tied rod **54** is pivotally connected **60** having an eyelet **63** at the bottom end of the vertically disposed rod **54.** Connected to the eyelet **63** are connecting links **66** which can be constructed of any suitably flexible material. As shown in FIG. **1,** three link chains **69, 70, 71** are utilized.

Attached to the other end of the connecting links are the sealing mechanisms **74** which comprise levered doors **78.** The closure means **74** may be pivotally connected at the bottom thereof on mounting brackets **82** to the container **11** by providing counter levers **84** extending in the same general plane as the doors **78** below the pivotal point **82.** Thereafter when the lever **84** is rotated the connecting rod **54** tensions the connecting links **69, 70, 71** pivoting the doors **78** through the counter levers **84** into a closed position. A seal **88** is provided around the periphery of the door **78** which, in conjunction with the weight and thus pressure of the water in the container **11,** assure a proper closure.

The upper portion of the container **91** is preferably filled with polystyrene foam **93** for floatation purposes when the water cannon **24** is utilized in the water.

Suction and expulsion means **98** are provided in the embodiment shown in FIG. **1** by a manually operated hydraulic cylinder **99.** A handle **104** suitable for either a child or an adult is integrally attached to an hydraulic ram **106** having O-ring seals **108** to alternatively establish a vacuum to draw water into the cylinder and to provide sufficient force to expel the fluid out of the gun **20.**

At an intermediate point along the barrel **111** between the cylinder **99** and the nozzle **114,** located forward of the inlet suction tube **26,** is a second one-way valve **118.** As shown in FIG. **1** the second one-way valve **118** is also a ball check valve **121** which is normally closed when the vacuum is created by retraction of the ram **106** from the hydraulic cylinder **99** and opens when force is applied to the ram **106** to drive it inward in order to expel the water.

At the terminal end of the barrel **111** a nozzle is provided which is precisely matched to the barrel **111** size and cylinder **99** size to assure a suitable distance for expulsion of the water but having a droplet size and force which will not be injurious to the eyes of small children. In practice, cylinder **99,** barrel **111** and nozzle **114** sizes of 1 1/4 inches, ½ inches, and 1/4 inches, respectively, have been found satisfactory.

A second embodiment of my invention is shown in FIGS. **2** and **3.** The basic structure of this embodiment

is similar to that shown in FIG. 1 and is numbered accordingly.

Variations include the water inlet closure means **74,** the one-way check valves **28, 118,** the expelling means **98** and the angle of the gun **20** with reference to horizontal. As shown in FIG. **2,** an alternative structure for closing the water inlet means **74** may comprise a circular strip **120** having an outer diameter **122** compatible with the inner diameter **123** of the container **11.** The strip **120** preferably contains a number of apertures **126** located circumferentially in alignment with the apertures **38** in the container **11.** As shown in the drawing the upper end lower edges of the apertures **38** may be turned inward to provide a track for the circumferential strip **120,** the edges of which should be turned inward to maintain alignment of the circumferential strip **120** with the apertures **38.** The seal **88** may then surround the apertures **38** between the aforesaid edges. Securely attached in spaced relation to the trailing edge of at least one of the apertures **38** should be a peg **130** which may be pulled to rotate the circumferential strip **120,** thereby closing all apertures **38** with one movement. As with the earlier embodiment, the seal **88** is provided to assure nonleakage.

One-way clapper valves **28, 118** comprising a rubber clapper mechanism **134** and washers **136** constructed of rubber or any other suitable material may be utilized to assure proper direction of flow. These may be used to replace and will serve the same function as the ball check valves **30, 121** discussed above and shown in FIG. **1.**

Also as shown in FIG. **2** the barrel **111** of the gun **20** may be inclinded at an angle of approximately twenty degrees. This provides a greater distance of travel of the expelled water at the same force as the apparatus shown in FIG. **1.**

Trigger actuated, spring loaded expulsion means **100** are best shown in FIG. **3.** A hollow hydraulic ram **106** similar to the ram **106** shown in FIG. **1** is provided with an O-ring seal **108** to create and maintain the vacuum for suction and for expelling the liquid. Located internally in the hollow chamber **139** of the ram **106** is a spring mechanism **142** which abuts on the rearward end an internal cylinder **144** having an outer diameter **146** less than the inner diameter **148** of the chamber **139** of the ram **106.** A suitable cavity **150** surrounding the internal cylinder **144** is provided in the interior of the handle **104** to allow maximum rearward travel of the ram **106** into the handle **104** of the gun **20.**

Securely attached to the exterior of the ram **106** is a bolt mechanism **152** which extends through an aperture **154** in the casing and which can be laterally retracted to compress the spring **142.** A notch **156** is provided at the rearward end of the bolt aperture **154** to cock the bolt **152** after the spring **142** has been compressed. A simple trigger mechanism **158** is pivoted on the forward end **160** thereof so that when the trigger **158** is pulled the upper surface **160** of the trigger mechanism **158** forces the bolt **152** out of the bolt lock aperture **156** to release the spring **142.**

As in the first embodiment, retraction of the cylinder **106** with the bolt mechanism **152** creates a vacuum and draws water into the cylinder **106.** Thereafter, a rearward movement of the trigger **158** releases the cylinder **106** and water is expelled due to forward movement of the cylinder **106** due to the pressure of the spring **142.**

The third embodiment of my invention is shown in FIG. **3.** It is a recreational vehicle which comprises a hull **171** for floatage in the water. Motive means **173** may be provided which are shown to be a propulsion pump or water wheel **174** which may be peddled in either direction. Steering means **176** may be a conventional rudder (not shown) attached to a driving wheel **178** as shown. Also as shown in FIG. **3,** a suitable seat **180** for the operator may be provided. The water gun **20** should perform essentially as those discussed above.

As shown in FIG. **4,** a small electrically operated transducer **184** may be utilized in lieu of the manually operated cylinder **99** or the spring loaded cylinder **100** shown in FIGS. **1** and **2.** The transducer **184** operates upon the pull of the trigger **158** to force a suitable amount of water from the container **11** through check valves **28, 118** and out the nozzle **114** as previously described. Water inlets **36** are provided extending from the cylinder **11** to the exterior of the boat and, since they will be under water at all times, no closure means **43** are necessary. In addition, water inlet **184** and outlet **185** orifices should be provided in the bottom of the hull **171** of the boat to supply the motive means **173** indicated above.

In general, while I have described specific embodiments of my invention, it is to be understood that this is for purposes of illustration only and that various modifications can be made within the scope of my invention.

I claim:

1. A water cannon comprising;

a container having a top and bottom;

an inlet suction tube including a one-way check valve extending from the bottom of said container to the top thereof;

a water gun attached to the top of said inlet suction tube comprising;

a barrel attached to said inlet suction tube,

suction and expulsion means attached to the rearward end of said barrel,

a nozzle attached to the forward end of said barrel,

a one-way check valve disposed in said barrel forward from the top of the inlet suction tube and rearward of the nozzle;

a water inlet located adjacent the bottom of the container for filling the container with water; and

internal closure means operatively positioned relative to the water inlet adjacent to the bottom half of the container for closing the water inlet partially extending through the container to effectuate closure so that the water does not leak out of the container when it is positioned on dry land.

2. The water cannon of claim **1** wherein the closure means comprise,

a connected lever assembly pivotly secured to the top of the suction inlet tube;

a tie rod pivotly connected to an intermediate portion of th lever having an eyelet at the bottom end thereof;

a flexible connecting link having two ends, one of which is connected to the eyelet of the tie rod;

a counter lever pivotly attached to the container adjacent the bottom thereof and attached to the flexible connecting link;

a water inlet door secured to the counter lever pivotly positioned in alignment with the water inlet; and

sealing means surrounding the periphery of the water inlet door whereby when the door is closed no water will leak from the container.

3. The water cannon of claim **2** further comprising,

a plurality of water inlets adjacent the bottom of the container;

a plurality of flexible connecting links each having two ends, one of which is connected to the eyelet of the tie rod;

a plurality of counter levers pivotly attached to the container adjacent the bottom thereof and each attached to one of the flexible connecting links;

a plurality of water inlet doors each secured to one of the counter levers pivotly positioned in alignment with the water inlets; and

sealing means surrounding the periphery of each of the associated water inlet doors whereby when all doors are closed no water will leak from the container.

4. The water cannon of claim **1** wherein said closure means comprise,

a circumferential strip which rotatively extends around the inner diameter of the container;

an aperture located circumferentially around the circular strip in alignment with the water inlet;

sealing means surrounding the aperture; and

a peg firmly secured to the circular strip which extends through the water inlet whereby lateral force applied to the peg rotates the circumferential strip thereby closing the water inlet.

5. The water cannon of claim **4** further comprising

a plurality of water inlets;

a plurality of apertures located circumferentially around the circular strip each in alignment with one of the plurality of water inlets; and

sealing means surrounding each of the plurality of apertures.

6. The water cannon of claim **1** further comprising

a boat hull having a top and a bottom and forward, median and rearward portions secured to and surrounding the container below the barrel of the water gun whereby the water gun portion of the water cannon extends longitudinally from the median portion above the top of the forward portion of the boat hull;

seating means for supporting the operator of the water cannon secured to the rearward portion of the boat hull;

manual motive means for propelling the boat hull through the water secured adjacent to the bottom of the boat hull and operatively positioned forward of the seating means to that the operator may propel the boat forward with his feet;

manual steering means for varying the direction of the boat hull when it is being propelled through the water operatively positioned relative to the water gun, motive means and steering means whereby the operator may operate the water gun while steering and propelling the boat hull; and

wherein the water inlet extends through the bottom of the boat hull.

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