

Aug. 24, 1937.

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2,090,731

CASTING AND HARPOONING GUN

Filed Feb. 13, 1934

2 Sheets-Sheet 1

Fig. 1.

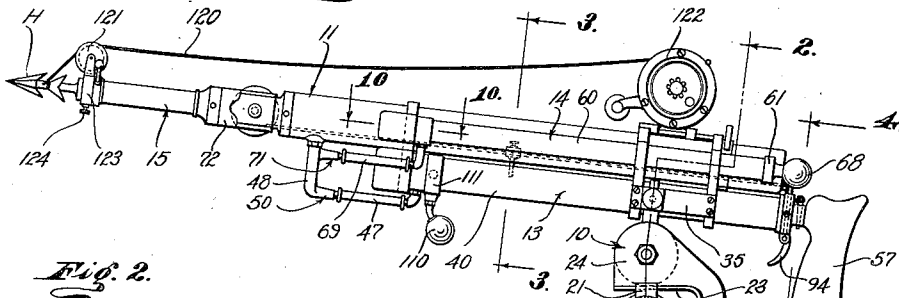


Fig. 2.

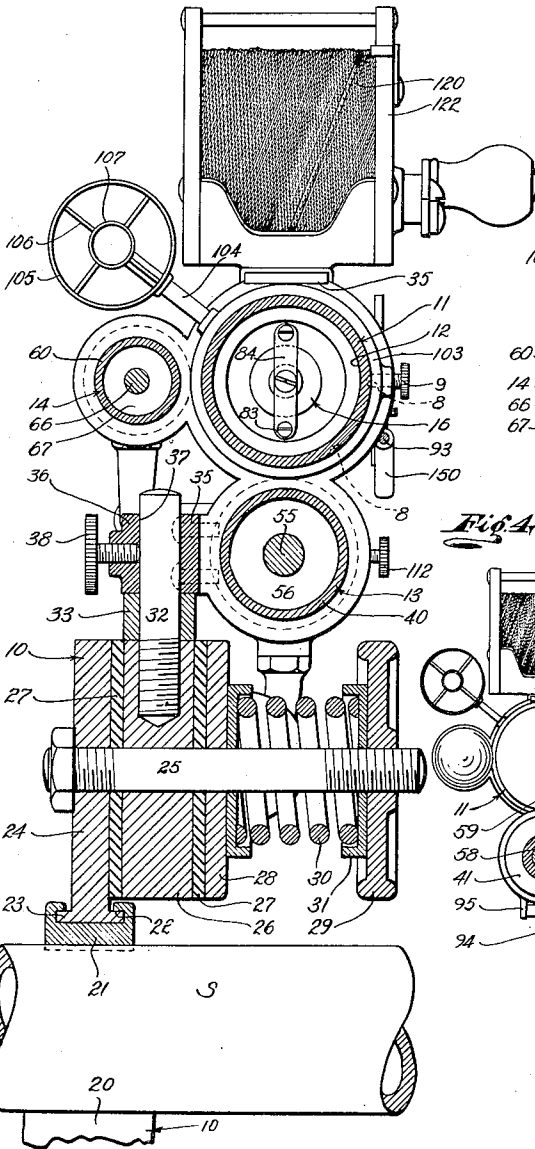


Fig. 3.

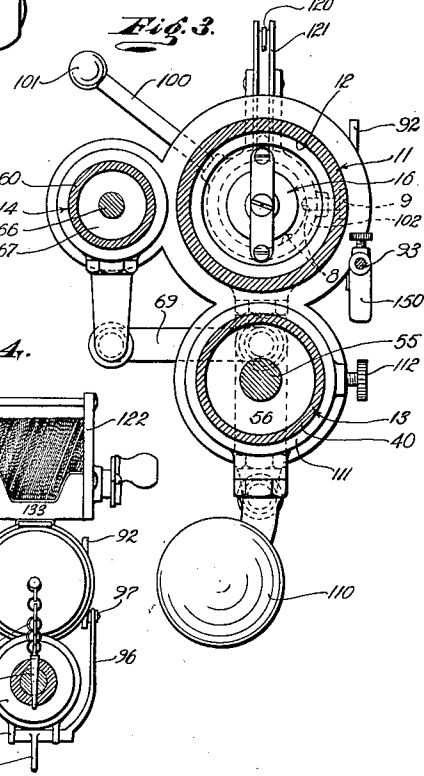
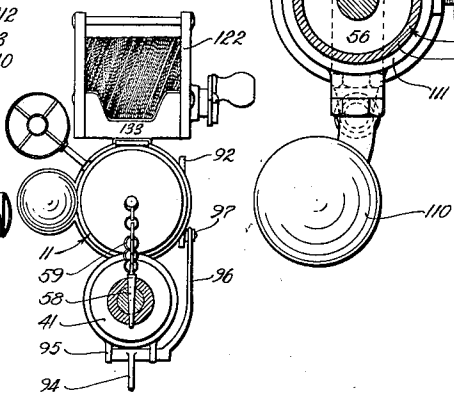


Fig. 4.



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2 Sheets-Sheet 2

Fig. 5.

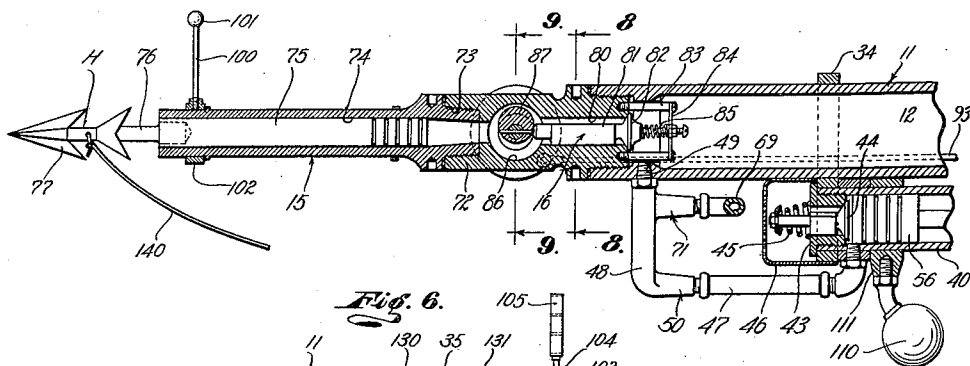


Fig. 6.

Fig. 7.

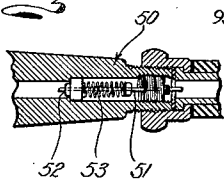


Fig. 8.

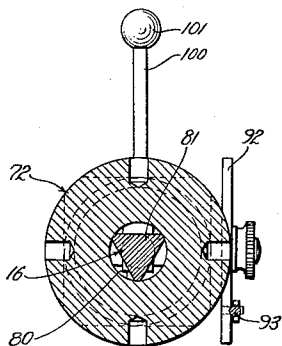


Fig. 9.

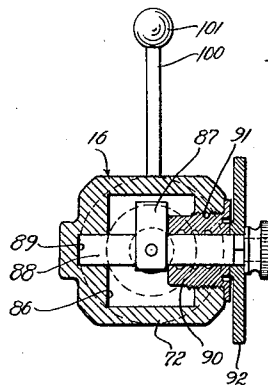


Fig. 10.

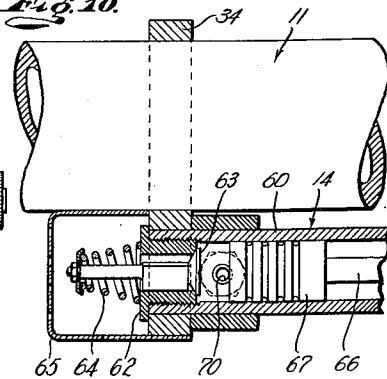
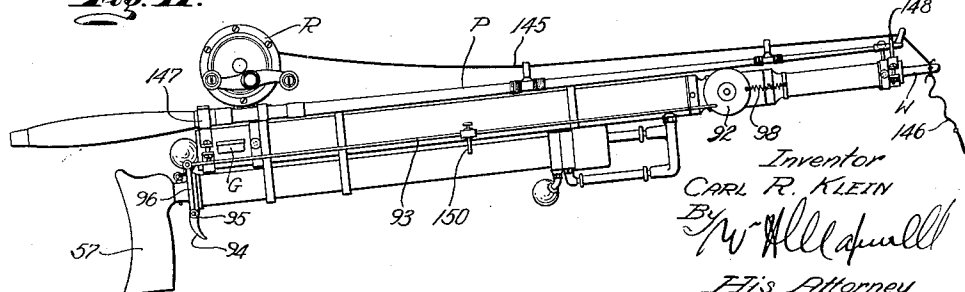


Fig. 11.



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UNITED STATES PATENT OFFICE

2,090,731

CASTING AND HARPOONING GUN

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Application February 13, 1934, Serial No. 711,031

4 Claims. (Cl. 124—8)

This invention relates to a casting and harpooning gun and a general object of the invention is to provide a practical and effective pneumatic gun for harpooning and for casting fishing lines, etc.

Another object of the invention is to provide a line casting and harpooning gun that does not require cartridges or explosive charges and that makes but little noise when fired or operated.

Another object of the invention is to provide a pneumatic harpooning and line casting gun that is easily manipulated and that may be readily directed or aimed in any desired direction.

Another object of the invention is to provide a line casting and harpooning gun of the character mentioned that is compact, light in weight, and that may be readily mounted on supports of various characters or held by the user.

Another object of the invention is to provide a pneumatic casting and harpooning gun that includes a manually operated pressure developing means for use in short range harpooning and casting, and a manually operated pressure developing means for building up higher or increased pressures for long range harpooning and casting.

Another object of the invention is to provide a line casting and harpooning gun that has an improved simplified universal mounting adapting it for application to supports of various shapes, etc.

A further object of the invention is to provide a casting and harpooning gun that may carry a reel for the harpoon line or fishing line or that may temporarily carry a fishing pole during the casting of its line.

Other objects and features of the invention will become apparent from the following detailed description of typical forms and applications of the invention, throughout which description reference may be had to the accompanying drawings, in which:

Fig. 1 is a side elevation of the device or gun of the present invention showing it attached to a support and carrying a reel. Fig. 2 is an enlarged detailed sectional view taken substantially as indicated by line 2—2 on Fig. 1. Fig. 3 is an enlarged transverse detailed sectional view taken as indicated by line 3—3 on Fig. 1. Fig. 4 is an enlarged transverse detailed sectional view taken substantially as indicated by line 4—4 on Fig. 1. Fig. 5 is an enlarged longitudinal detailed sectional view of the outer portion of the gun illustrating the outer sight in the upright position and showing a harpoon in the gun barrel.

Fig. 6 is an enlarged longitudinal detailed sectional view of the inner portion of the gun showing the inner sight in the upright position. Fig. 7 is an enlarged fragmentary detailed sectional view illustrating a portion of the manifold and a check valve. Figs. 8 and 9 are enlarged transverse detailed sectional views taken as indicated by lines 8—8 and 9—9, respectively, on Fig. 5. Fig. 10 is an enlarged fragmentary detailed sectional view taken substantially as indicated by line 10—10 on Fig. 1 and Fig. 11 is a side elevation of the gun illustrating a fishing pole in position on the gun.

The device or gun of the present invention is adapted for use in various situations and for various purposes. The gun may be readily mounted on boats, piers, etc. and is useful as a harpooning gun and for the casting of fishing lines, the advance lines of breeches buoys, etc. Throughout the following detailed disclosure I will describe a typical preferred form of the invention employed in several different manners, it being understood that the invention is not to be construed as limited or restricted to the specific details about to be set forth, but is to be taken as including any features or modifications that may fall within the scope of the claims.

The device or gun of the invention includes generally a mounting 10, a cylinder or body 11 having a pressure chamber 12, means 13 for supplying air under pressure to the chamber 12, means 14 for developing increased or higher pressures for the chamber 12, a barrel 15 from which the harpoon or cast object is ejected, a trigger controlled valve 16 for admitting air under pressure from the chamber 12 into the barrel 15, and other parts, the details and functions of which will be hereinafter described.

The mounting 10 is provided to carry the gun proper and in accordance with the invention is such that the gun may be aimed or directed in any direction as desired. It is a feature of the invention that the mounting 10 is such that it may be applied to objects or supports of various characters, for example it may be connected with the gunwale of a boat or the rail of a boat or pier. The mounting 10 includes a clamp 18 for gripping or connecting with a support. The clamp 18 may be a C clamp having a body or jaw of substantially C shape whose open side or mouth is adapted to receive the support S. A clamp screw 19 is threaded through an opening in the lower arm of the C clamp 18 and carries on its inner end a rotatable pad or head 20 for engaging the support S. The lower end of the

screw 19 is provided with the usual or typical handle. A pad or block 21 may be provided on the upper jaw of the clamp 18 for engaging the support S. The block 21 may be removable and may have grooves 22 slidably receiving the flanges 23 of the clamp. In the drawings I have shown the mounting 10 attached to a tubular cylindrical support S and the block 21 is designed to effectively cooperate with such a support. It will be apparent how the screw 19 may be threaded inwardly to tightly and securely connect the clamp 18 with the support S in the desired or proper position.

The C clamp 18 has a flat upstanding extension 24 on its upper end. A lateral or horizontal shaft 25 projects from the extension 24. A block or disc 26 is rotatable on the shaft 25 and washers 27 of fiber or other material are arranged on the shaft at the opposite ends of the disc. The mounting 10 includes means for yieldingly resisting turning of the disc 26 on the shaft 25. A plate 28 is arranged against the outer washer 27 and an adjustable nut 29 is threaded on the outer end portion of the shaft. A helical spring 30 is arranged under compression between the plate 28 and the nut 29 to hold the assembly of the disc 26 and washers 27 clamped between the plate 28 and the clamp extension 24. The opposite ends of the spring 30 may seat in suitable cups 31. The nut 29 may be adjusted along the shaft 25 to vary the action of the spring 30. Turning or rotation of the disc 26 is at all times yieldingly resisted by the action of the spring 30 so that the disc 26 remains stationary until the gun is deliberately tipped, as will be hereafter described. A pin or stud 32 projects radially from the disc 26 to carry the gun. A spacer or sleeve 33 surrounds the lower portion of the stud 32.

The cylinder or body 11 is an elongate structure and is hollow, providing the pressure reservoir or chamber 12. In the particular case illustrated in the drawings the body 11 is cylindrical in transverse cross section and its inner end is closed by an integral head. The valve means 16 normally closes the outer end of the body chamber 12 as will be subsequently described. The body 11 projects inwardly over the mounting 10 and is supported on the stud 32. The spaced webs 34 extend around the body 11 and project downwardly therefrom. The two webs 34 are connected by one or more plates 35. The webs 34 are suitably attached to the body 11 and serve as frame members or connecting members of the gun. A lug 36 projects from one of the plates 35 and has an opening 37 for receiving or passing the stud 32. The lower end of the lug 36 engages or rests on the sleeve 33 and the lug is adapted to rotate or turn on the stud. A set screw 38 may be provided for releasably setting or locking the lug 36 against rotation on the stud 32, whereby the gun may be releasably held against turning on the stud. It is believed that it will be apparent how the gun may be swung about the axis of the shaft 25 and swung or pivoted about the axis of the stud 32 to be aimed in any desired direction. A suitable pressure gauge G is provided for indicating the pressure in the chamber 12.

The means 13 for supplying air under pressure to the body chamber 12 is a manually operated means which may be employed to develop the air pressure for ejecting the harpoon or object on the line for medium or short range use, and may be used for building up an initial pressure in the

chamber 12 which may be increased or raised by the means 14 when higher pressures are required. The low pressure developing means 13 includes a cylinder 40 which may be arranged adjacent and parallel with the body 11. In the particular arrangement illustrated in the drawings the cylinder 40 is spaced directly below the body 11. The cylinder 40 extends through aligned openings in the webs 34 and is suitably connected with the webs. In practice the cylinder 40 is somewhat smaller in diameter than the body 11 and is shorter than the body. A cap 41 is screw threaded on the outer end of the cylinder 40 and projects beyond the inner end of the body 11. A breather opening or port 42 is provided in the cap 41 to communicate with the interior of the cylinder. A tubular valve member 43 is threaded in the outer end of the cylinder 40 and the passage of air through its opening is controlled by an inlet valve 44. The inlet valve is normally held closed by a spring 45 arranged under compression between the outer end of the member 43 and the stem of the valve. A perforated protective cap 46 may enclose the spring 45 and the projecting valve stem.

An air discharge port communicates with the interior of the cylinder 40 adjacent the outer end of the cylinder and a conduit 47 extends from this port. The conduit 47 connects with a manifold 48 which has communication with an inlet port 49 in the body 11. The port 49 communicates with the chamber 12 at its forward or outer end. The conduit 47 is preferably formed of flexible tubing whereby it may be easily disconnected or removed. A check valve 50 is provided in the branch of the manifold 48 connecting with the conduit 47. The flow controlling assembly of the check valve 50 may be what is commonly termed a "valve inside", and of the type that is employed in the valve stems of the inner tubes of vehicle tires. This assembly comprises a stem 51, carrying a valve head 52 and normally held in a position where the valve is closed by a spring 53.

A rod 55 slidably passes through an opening in the cap 41 and carries a piston 56 for operation in the cylinder 40. A handle 57 is provided on the projecting outer end of the rod 55. The handle 57 may be similar to a pistol grip or a gun stock to facilitate the handling and aiming of the gun. The handle 57 may be readily gripped and held when the rod 55 is reciprocated to operate the piston 56 in the cylinder. Means may be provided for releasably locking the rod 55 and handle 57 against movement when the gun is to be aimed and discharged. A tapered pin 58 may be passed through registering openings in the cap 41 and the rod 55 to lock the rod 55 against movement. The pin 58 is readily removable and is preferably carried by a chain 59. Reciprocation of the piston 56 in the cylinder 40 forces air under pressure into the chamber 12 of the body 11.

The means 14 is provided for supplying air under comparatively high pressures to the chamber 12 when it is desired to eject the harpoon or casting object at a high velocity and with great force. The means 14 is in the nature of a cylinder and piston means and includes a cylinder 60 arranged at one side of the body 11. The cylinder 60 extends through openings in the webs 34 and is suitably attached to the webs. The cylinder 60 is smaller in diameter than the cylinder 40 and its outer end is closed by a cap 61. A tubular valve seat 62 is threaded into the

outer end of the cylinder 60 and is normally engaged by a valve 63. A spring 64 acts on the stem of the valve 63 to normally yieldingly hold the valve in its closed position. A perforated protective cap 65 may enclose the spring 64 and the projecting portion of the valve stem. A rod 66 is slidable through an opening in the cap 61 and carries a piston 67 for operation in the cylinder 60. A suitable operating handle or knob 68 is provided on the projecting portion of the rod 66. A conduit 69 extends from a discharge port 70 in the outer end of the cylinder 60 to a branch of the manifold 43. The conduit 69 is preferably formed of rubber tubing or other flexible tubing whereby it may be readily removed. A check valve 71 is provided in the branch of the manifold to prevent air under pressure from backing up into the cylinder 60. The check valve 71 may be identical with the check valve 50 described above. After the means 13 has been operated to create an initial pressure in the chamber 12 the high pressure developing means 14 may be operated to increase the pressure on the air in the chamber 12. Either of the conduits 47 or 69 may be removed to permit the connection of a pipe or line with the manifold 43 to supply the chamber 12 with air under pressure from a power operated compressor or the like.

The gun barrel 15 projects outwardly from the body 12 of the valve 16. The barrel 15 is adapted to receive and carry the harpoon, missile, or weighted object connected with the line to be cast. The inner end of the barrel 15 is screw threaded into a socket 73 in the outer end of the valve body 72. The longitudinal opening or bore 74 of the barrel 15 is open at its outer end for the reception and ejection of the harpoon or missile and its inner end is in communication with the interior of the valve body 72. In accordance with the broader aspects of the invention the barrel 15 is adapted to receive missiles and objects or weights of various characters. In Figs. 1 and 5 of the drawings I have shown a harpoon H arranged in the barrel 15. The harpoon H has a shank 75 which fairly accurately slidably fits the bore 74 of the barrel. The inner end portion of the harpoon shank 75 may be provided with suitable sealing grooves. In practice it may be found desirable to make the shank 75 hollow or to construct it of relatively light material such as aluminum. The active portion of the harpoon H comprises a stem 76 projecting from the shank 75 and one or more barbs 77 on the stem. The stem 76 and the barbs 77 may be comparatively heavy in weight so that the harpoon H will travel in the desired manner when ejected or discharged from the barrel. Fig. 11 of the drawings illustrates an object or weight W connected with a fishing line and introduced into the barrel 15 prior to the discharge of the gun. The portion of the weight W which projects from the barrel 15 may be plain or cylindrical and provided with suitable means for connecting with the fishing line and for carrying leaders, etc.

The valve 16 may be manually operated to admit air under pressure from the chamber 12 into the bore 74 of the barrel 15 to expel or discharge the harpoon H or the weight W. The valve 16 includes the valve body 72 interposed between the body 11 and the barrel 15. The longitudinal passage 80 in the valve body 72 extends from the chamber 12 to the inner end of the bore 74. A valve stem 81 of fluted or triangular cross section is slidable in the passage 80

and carries a valve head 82 for cooperating with a seat at the outer end of the passage 80. Spaced posts 83 project from the inner end of the valve body 72 and carry a transverse plate 84. A spring 85 is arranged under compression between the valve head 82 and the plate 84 to normally yieldingly hold the valve head 82 in its closed position and to automatically return it to the closed position after being opened. A transverse opening 86 intersects the passage 80 of the valve body and a cam 87 for opening or unseating the valve head 82 is arranged in this transverse opening. The cam 87 is in the nature of an eccentric disc carried by a pin 88. Upon turning of the pin 88 the cam 87 is adapted to cooperate with the end of the valve stem 81 to shift the valve stem and unseat the valve head 82. One end of the pin 88 rotatably seats in a socket 89 in the valve body 72, while the other end portion of the pin extends through an opening in a bearing 90. The bearing 90 is threaded into an opening 91 in the wall of the valve body 72. The opening 91 is sufficiently large to pass to the cam 87 after the bearing 90 has been removed and the pin 88 has been disengaged from the socket 89.

In accordance with the invention the valve 16 is adapted to be opened or operated by a trigger at the inner end of the gun. The means for operating the valve 16 includes a crank wheel or disc 92 on the projecting outer end of the pin 88. A crank or link 93 is pivotally connected with the disc 92 at a point spaced from its axis. The link 93 extends inwardly to a point above and adjacent the cap 41. A depending trigger 94 is pivotally supported by lugs 95 on the cap 41. A lever arm 96 is provided on the trigger 94 and projects upwardly at one side of the cap 41. A suitable pivotal connection 97 is provided between the lever arm 96 of the trigger and the link 93. A spring 98 is connected with the disc 92 for automatically returning the cam 87 and the trigger 94 to their normal positions when the trigger is released after being operated. Pulling or operation of the trigger 94 results in movement of the link 93, turning of the disc 92 and cam 87 to cause unseating of the valve 82, whereupon air under pressure from the chamber 12 enters the bore 74 of the barrel 15 to forcibly expel or discharge the harpoon H or the weight W. A trigger finger 100 is provided on the link 93 at a point between its ends for use when the user holds the stock 57 at his shoulder.

Suitable sights may be provided on the body 11 and the barrel 15. The sight on the barrel 15 may comprise a rod 100 carrying at its outer end a ball 101. The rod 100 projects outwardly from a ring 102 which surrounds the barrel 15. The ring 102 is rotatable on the barrel 15 so that the sight ball 101 may be arranged in different rotative positions. The sight provided on the inner end portion of the body 11 includes a ring 103 surrounding the body. A rod 104 projects from the ring 103 and carries an upstanding ring 105 having radial webs 106 carrying an inner ring 107. The supporting ring 103 is rotatable on the body 11 so that the sight ring 105 may be positioned as desired. It will be apparent how the two sights may be positioned and related so that the ball 101 and the target may be sighted through the small inner ring 107. Set screws 9 may be provided to cooperate with sockets 8 to releasably set the sights in definite alignment. The sights may project upwardly from the gun when the gun is employed without a fishing pole and without a reel, or may be arranged to pro-

ject from the gun in inclined positions when a reel or other object is provided on the gun as illustrated in Figs. 1 to 4 of the drawings.

A shiftable or adjustable handle 110 may be provided on the cylinder 40. The grip or handle 110 may consist of a ball supported on the outer end of a rod. The rod of the handle 110 projects from a ring 111 which surrounds the cylinder 40. The ring 111 is rotatable and longitudinally shiftable on the cylinder 40 so that the handle may be adjusted as desired. A set screw 112 may be provided to releasably hold the handle 110 in the desired position.

As hereinbefore pointed out the device or gun of the present invention may be employed for various purposes. Fig. 1 of the drawings illustrates the harpoon H projecting from the outer end of the barrel 15 prior to operation or discharging of the gun. A line 120 is connected with the harpoon H, and extends rearwardly over a guide pulley 121 to a suitable spool or reel 122. The line guiding pulley 121 is rotatably carried by a ring 123 which may be readily slid over the outer end portion of the barrel 15 and releasably set in position by a set screw 124. When the pulley 121 is used it may be necessary to turn the ring 102 to a position where the sight ball 101 is spaced at one side of the pulley. The invention includes means for detachably connecting the reel 122 with the body 11. A lug on one of the webs 34 is provided with a socket or recess 130. The recess 130 occurs directly above one of the plates 35 and a loose sleeve 131 is shiftable on this plate. In mounting the reel 122 the usual flange 133 of the reel is arranged on the plate 35 so that its outer end portion is received in the recess 130. The sleeve 131 is then passed over the other end portion of the flange 133 to retain the reel in position. When the pulley 121 and the reel 122 are mounted on the gun as described above the sights may be arranged to project from the gun at suitable angles and may be aligned so that the ball 101 of the outer sight is aligned with the ring 107 of the inner sight. Figs. 1, 2, 3 and 4 of the drawings illustrate the sights in positions for use when the pulley 121 and the reel 122 are mounted on the gun.

Fig. 5 of the drawings illustrates a line 140 connected with the harpoon H and extending inwardly. The line may be wound on a suitable reel or may be attached to a buoyant body such as a keg, or the like, with which the fish may fight when harpooned. Where the line 140 from the harpoon H extends inwardly clear of the gun the sights may be arranged in their upright operative positions, as illustrated in Figs. 5, 6, 8 and 9. Fig. 11 of the drawings illustrates an adaptation or application of the invention wherein a typical fishing pole P is removably or temporarily attached to the gun. The pole P may carry a reel R and the line 145 from the reel R may extend through the usual guides on the pole and be attached to the weight W. One or more leaders 146 for carrying the fishing hooks may be connected with the line 145 or with the weight W as illustrated in the drawings. Spring grips 147 may be provided on the body 11 of the gun to temporarily connect the pole P with the gun when the gun is fired or discharged to expel the weight W, and thus cast the line 145. Spaced projecting guides 148 may be provided on the barrel 15 to retain the outer portion of the pole P in its proper position on the gun. After the line 145 has been cast by the gun the pole P may be read-

ily disconnected from the gun and used in the usual manner.

It is believed that the operation of the casting and harpooning gun provided by the invention will be readily apparent from the foregoing detailed description. Assuming that the gun is mounted on the support S by the means 10 and carries the reel 122 and the guide pulley 121, as illustrated in Figs. 1, 2, 3 and 4 of the drawings, the gun may be prepared for operation or use by reciprocating the piston rod 55. Manual reciprocation of the piston rod 55 of the low pressure developing means causes air under pressure to be supplied to the chamber 12. Where it is desired to fire the harpoon H at short or medium ranges sufficiently high pressures may be provided in the chamber 12 by the manual operation of the means 13. If it is desired to fire the harpoon H a greater distance it may be necessary to operate the high pressure developing means 14 to provide higher pressures in the chamber 12. After operation of the pressure developing means 13 the pin 58 may be arranged in the openings in the cap 41 and the rod 55 to lock the rod and the handle or stock 57 against movement. The gun may be readily aimed or directed in any required direction and if necessary or desired the sights described above may be employed in aiming the gun at the fish or target. To fire or discharge the gun the trigger 94 is pivoted to cause turning of the cam 87 and unseating of the valve 82. This unseating or opening of the valve 82 is sudden and permits the sudden discharge of the air pressure from the chamber 12 into the bore 74 of the barrel. The harpoon H is forcibly ejected from the barrel at a comparatively high velocity and carries with it the line 120. Upon releasing the trigger 94, after the operation or discharging of the gun, the spring 98 returns the link 93 and the trigger to their normal positions and the spring 85 recloses the valve 82. Another harpoon may be positioned in the barrel 15 and the desired or proper air pressure may be again supplied to the chamber 12 by the means 13 and/or 14 to provide for the further firing of the gun. It is believed that the manner of employing the gun for various purposes will be readily understood. When casting the line 145 of the fishing pole P the firing or discharging of the gun results in the forcible expulsion or projection of the weight W from the barrel 14 and the line 145 is carried with the weight and thus cast.

The mounting 10 is such that the gun may be easily and quickly attached to supports of various sizes and characters and allows for the easy and accurate aiming of the gun. Further, if desired, the mounting 10 may be disconnected from the support and the gun may be held by the user when fired. When employed in this manner the stock 57 may be held against the shoulder and the trigger finger 150 may be engaged and pushed to open the valve 82 in discharging the gun. The device or gun provided by the invention is compact and light in weight, and simple and inexpensive of manufacture.

Having described only typical forms and applications of my invention, I do not wish to be limited or restricted to the specific forms and applications herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art or fall within the scope of the following claims.

Having described my invention, I claim:

1. A casting and harpooning gun of the char-

acter described including a body having a chamber, a barrel connected with the outer end of the body and having a bore for receiving the object to be ejected, a trigger controlled valve for governing communication between the chamber and bore, and means for supplying air under pressure to the chamber including a cylinder having valved communication with the chamber, a piston in the cylinder, a reciprocable rod connected with the piston and projecting from the cylinder at the inner end of the body, and a handle rigid with the projecting portion of the rod for operating the rod and forming the stock of the gun.

2. A casting and harpooning gun of the character described including a body having a chamber, a barrel connected with the outer end of the body and having a bore for receiving the object to be ejected, a trigger controlled valve for governing communication between the chamber and bore, and means for supplying air under pressure to the chamber including a cylinder having valved communication with the chamber, a piston in the cylinder, a reciprocable rod connected with the piston and projecting from the cylinder at the inner end of the body, a handle on the projecting portion of the rod for operating the rod shaped

to form the stock of the gun, and means for holding the rod against movement when the handle is used as the gun stock.

3. A casting and harpooning gun including a body having a chamber, a barrel connected with the outer end of the body and having a bore for the reception of the object to be ejected, a trigger controlled valve for governing the admission of air under pressure into the bore from the chamber, means for developing pneumatic pressure for delivery to the chamber, and separate means for developing higher pneumatic pressures for the chamber.

4. A casting and harpooning gun including a body having a chamber, a barrel connected with the outer end of the body and having a bore for the reception of the object to be ejected, a trigger controlled valve for governing the admission of air under pressure into the bore from the chamber, manually operatable means for supplying air under pressure to the chamber, and independently manually operatable means for developing higher pneumatic pressures for the chamber.

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