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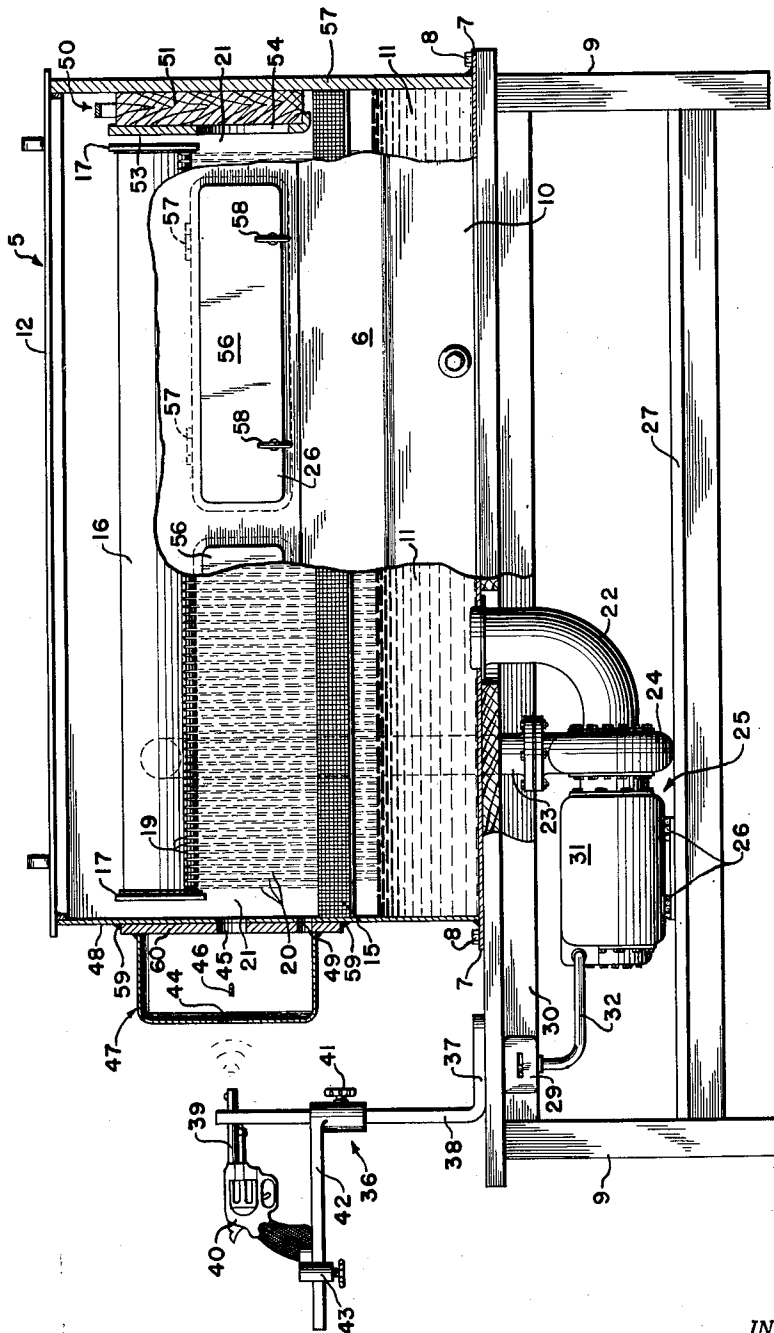
2,631,454

WATER GUN BUTT AND APPARATUS

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2 SHEETS—SHEET 1

FIG. 1.



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2 SHEETS—SHEET 2

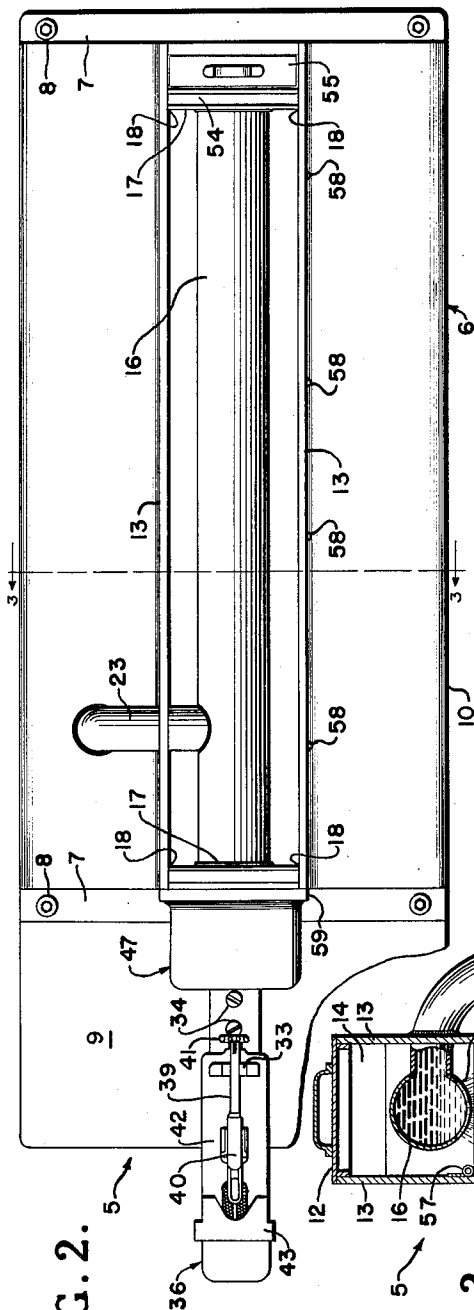


FIG. 2.

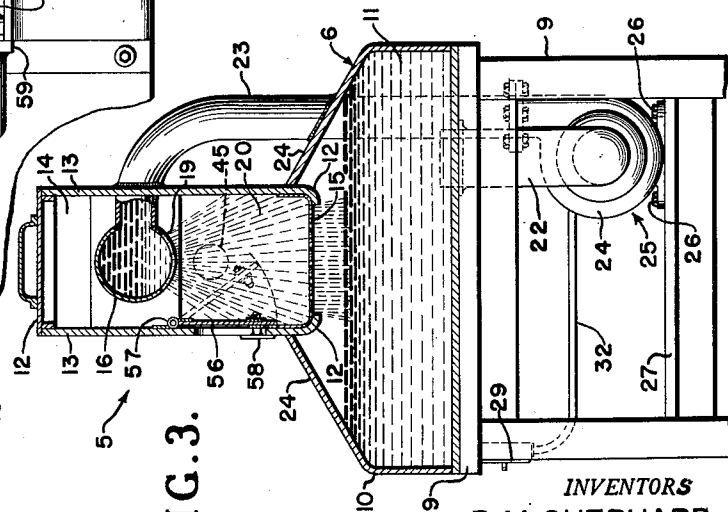


FIG. 3.

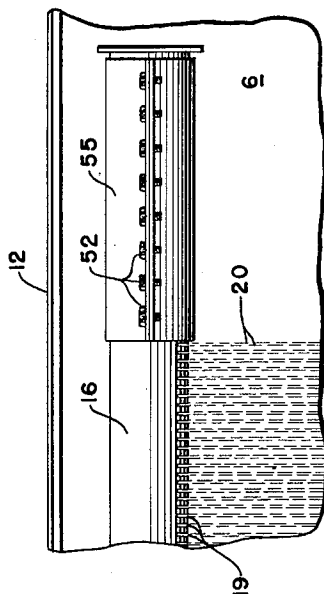


FIG. 4.

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WATER GUN BUTT AND APPARATUS

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This invention relates generally to bullet traps and more particularly to a new and improved apparatus for stopping projectiles for ballistic study.

The testing of new firearms or the acceptance test of ammunition requires considerable shooting and in such case projectiles are not, as a general rule, directed at a particular target but fired into a body of either water or sand, as the case may be, for subsequent recoveries therefrom for the purpose of either examination or for salvage as scrap metal.

The recovery of projectiles for ballistic study has been extensively practiced for many years and, whereas, sand butts or solid water butts of the conventional type have been more commonly employed for stopping projectiles fired for general test purposes, butts of cotton waste or kapok are more universally used for stopping projectiles to be recovered intact for ballistic examination. The soft yielding resistance of lightly packed cotton so gradually reduces the speed of a projectile in flight that relatively little damage is done thereto during the stopping operation in contrast to that received by a projectile in striking butts of sand or in some less degree in striking solid masses of water as in the case of conventional water butts.

Although cotton or kapok butts of the type indicated have been found generally satisfactory for single shot firing, the difficulty and time required in preparing by rearranging the fibrous filling of such butts between shots makes them highly impracticable for testing either firearms or ammunition where considerable shooting is required.

The gun butt of the present invention possesses all the advantages and none of the disadvantages of the foregoing apparatus by providing for an arrangement wherein a plurality of thin water sheets are directed across the path of the projectile to be stopped, and as the sheets are progressively penetrated by the projectile in flight the speed thereof is proportionally reduced sufficiently to decelerate to a stop the projectile within a selected trajectory while at no instant applying thereto a sufficient shock force to deform or alter the physical characteristics of the projectile from the manner in which it left the barrel of the gun from which it was fired.

It is an object of the present invention to provide an apparatus for reducing to a stop a projectile in flight after a predetermined travel thereof without deformation of the projectile during the stopping operation.

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A further object is to provide a new and improved water butt wherein the butt is comprised of a plurality of predetermined spaced sheets of water.

A still further object is to provide a gun butt wherein water is directed in sheets across the path of a projectile to be stopped.

A still further object is to provide a gun butt wherein the flow of a fluid system is separated into spaced fluid sheets as it is passed before a projectile to be stopped.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a side view partly in section of the gun butt of the present invention;

Fig. 2 is a plan view in elevation of the gun butt with the cover of the tank removed;

Fig. 3 is a sectional view taken along the sectional line 3-3 of Fig. 2; and

Fig. 4 is a fragmentary view in elevation of an arrangement for blocking off a selected number of the slots of the tube.

Referring now to the drawings and more particularly to Fig. 1 thereof the gun butt of the present invention is generally designated 5 and is shown to include a rectangular tank assembly generally designated 6 adapted, as by an extending flange portion 7 thereof, to be secured by bolts 8 to the upper surface of a table or platform 9 upon which the tank is supported.

The tank is comprised of a relatively large base portion 10, Fig. 3, adapted for retaining therein a suitable quantity of liquid 11 such, for example, as water and which may be admitted to the tank in any suitable manner as through the narrowed open top portion 14 thereof shown closed as by a removable cover plate 12. This enlarged base portion 10 of the tank will hereinafter be referred to as the reservoir and from which the fluid required for operating the device is supplied.

The narrowed upper portion 14 of the tank, Fig. 3, is formed by the elongated side wall sections 13 thereof extending downwardly below the point of securement therewith of the wall sections 24 of the lower or large portion 10 of the tank with the wall sections 13 being inwardly flanged at their lower ends 12 for retaining therebetween an elongated strainer or basket 15 constructed of any suitable foraminous material 55 such, for example, as wire mesh, perforated metal

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or the like, the purpose of which will become more clearly apparent as the description proceeds.

Centrally arranged within the upper portion 14 of the tank is an elongated dispensing tube 16 adapted, by means of end plate portions 17 thereof, Fig. 2, to be secured to the side wall sections 13 of the tank by welding thereto at 18.

The tube 16 is provided along its under surface with a plurality of transverse slots 19 preferably milled therein and selectively spaced, as illustrated, so as to form liquid passing through these slots into narrow sheets 20 that are directed downwardly across a chamber 21 formed between the tube and the basket 16 and 15 respectively.

In order that the necessary volume of liquid may be supplied from the reservoir 10 to the dispensing tube 16 to accommodate the liquid discharge from the slots 19, a high capacity pumping system is provided and arranged for connecting through conduits 22 and 23 the reservoir with the tube 16 by way of a motor and pump assembly generally designated 25 secured as by bolts 26 to a platform 27 forming the lower brace of the table 9. An electric switch 29 secured conventionally to the table flange 30 controls the energizing of the motor 31 by supplying current thereto through the electrical conduit 32.

The starting of the pump motor 31 by closure of the switch 29 causes the necessary volume of water to be drawn from the reservoir 10 and returned thereto by way of the transverse slots 19 in the dispensing tube 16 thereby to provide, during the operation of the device, a continuous spray in the form of the thin liquid sheets 20 across the chamber 21 and through which a projectile directed from a gun under test is forced to penetrate.

Arranged on and secured as by screws 34, Fig. 2, to a forwardly extending portion of the table 9 is a gun rack generally designated 36 and including an angular bracket 37 of which the vertical leg portion 38 thereof is notched at 33, Fig. 2, for receiving therein the barrel of the gun 40 to be fired. Movable vertically upon the leg 38 of the bracket and equipped for being secured thereto, as by clamp screw 41 in selected positions of vertical adjustment, is a butt rack 42 equipped with a horizontal adjustable member 43 whereby with proper adjustment of this rack and member 42 and 43 respectively, the barrel 39 of the gun may be brought into accurate alignment with openings 44 and 45 provided in the forward sections of the tank and arranged for admitting to the chamber 21 the projectile 46 of the gun when fired.

Secured as by welding at 59 to the forward section 48 of the tank is a rectangular guard housing 47 of which the side 60 thereof adjacent the tank is preferably formed from armor plate whereby a projectile missing the opening 45 is deflected rather than possibly puncturing the thinner wall section 48 of the tank to which the housing is secured. The purpose of the housing 47 is to prevent possible ricochets from the surface of the plate 56 from injuring the operator and further to catch such spray as may spatter through the opening 45 and return this liquid again to the tank through an opening 49 provided therefor in the lower portion of the housing and shown to advantage in Fig. 1.

A back stop assembly generally designated 50 and including a removable rectangular block 51 or any suitable material such, for example, as

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wood provides means whereby certain tests may be conducted to determine the penetrating power of a projectile at selected speeds controllable by the number of sheets 20 the projectile is required to penetrate before striking the surface of the block.

Secured as by welding to the side walls of the tank and adapted to retain in position in the tank the block 51 is a plate 53 having therein an opening 54 suitable for admitting the projectile 46 to the face of the block if, for certain reasons, the projectile is not stopped in the chamber 21. The plate 53 is spaced from the tank wall to which it is welded a distance sufficient to slideably receive block 51 therebetween. The back plate 51 of the tank is preferably formed of armor plate sufficiently thick to stop a projectile should a selection of too few water sheets and blocks fail to do so.

The blocking off of certain groups of the slots 19 of the tube may be accomplished in any suitable manner as, for example, the method disclosed in Fig. 4 wherein a two part tubular section 55, preferably having a gasket liner, not shown, is shown secured as by bolts 52 about the tube 16 in such a manner as to prevent fluid escaping from the slots 19 covered thereby. It will be understood that a selected number of the slots may be covered in this manner by providing tubular sections 55 of the required length for the purpose intended.

Referring now briefly to the operation of the device thus far described, the switch 29 is first thrown to energize the motor 31 which, by operating the pump 24, draws the water 11 from the lower portion 16 of the tank and by way of conduit 22 to discharge this liquid through conduit 23 into the dispensing tube 16 to be disbursed therefrom through the elongated slots 19 of the tube. The flow of the water from the tube 16 in this manner, produces across the chamber 21, a multiplicity of thin water sheets 20 that are so arranged as to be penetrated in progressive order by a projectile 46 fired through openings 44 and 45 in the forward sections of the tank and moving longitudinally through the chamber 21. The effect on the projectile by engagement therewith of these sheets is to gradually reduce the velocity thereof to a stop after having penetrated a selected number of these sheets corresponding in total thickness to less than half the solid water penetration required to stop a similarly moving projectile. Projectiles stopped in this manner remain substantially undamaged even though they may be of lead and initially traveling at high velocity.

The spent projectiles drop to the surface of the screen 15 from which they may be readily recovered by unfastening the plates 56 by rotation of the latch elements 53 therefor and swinging inwardly the plates secured as by hinges 57 to the inner surface of the tank wall 13.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without 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:

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1. A gun butt of the character disclosed for decelerating a bullet to be stopped including, in combination, a fluid supply, a dispersing chamber for receiving therein fluid from said supply, and means including a plurality of slotted portions in said dispersing chamber for discharging said fluid from the chamber as a plurality of spray sheets arranged in mutually parallel and spaced relationship across the path of the projectile to be stopped.

2. A gun butt of the character disclosed for decelerating a projectile within the trajectory thereof including, in combination, a fluid supply tank, a fluid reservoir, a fluid conduit system including a pump for supplying fluid from said reservoir under a predetermined pressure thereon to said supply tank, and a plurality of elongated discharge slots arranged transversely to the line of projectile's flight provided in the base of said supply tank for discharging the fluid therefrom in a plurality of spaced sheets across the path of the projectile to be stopped.

3. A gun butt of the character disclosed adapted to stop a projectile in flight including, in combination, a fluid system having a first tank for retaining a quantity of fluid therein and a dis-

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charge tank in fluid communication with said first tank for receiving fluid therefrom, a plurality of fluid discharge ports arranged in said discharge tank in the form of selectively spaced elongated slots through which fluid discharge therefrom is formed into spaced fluid sheets, and means for causing said projectile to be directed in a manner to intersect said sheets in progressive order during the trajectory thereof.

4. A gun butt as in claim 3 further characterized by the provision of means for closing a selected number of said slots to decrease the number of said fluid sheets to be intersected by the projectile.

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