Feb. 7, 1950 E. H. WALTKE 2,496,323

BUFFER

Original Filed Dec. 15, 1943

Fig. 1.

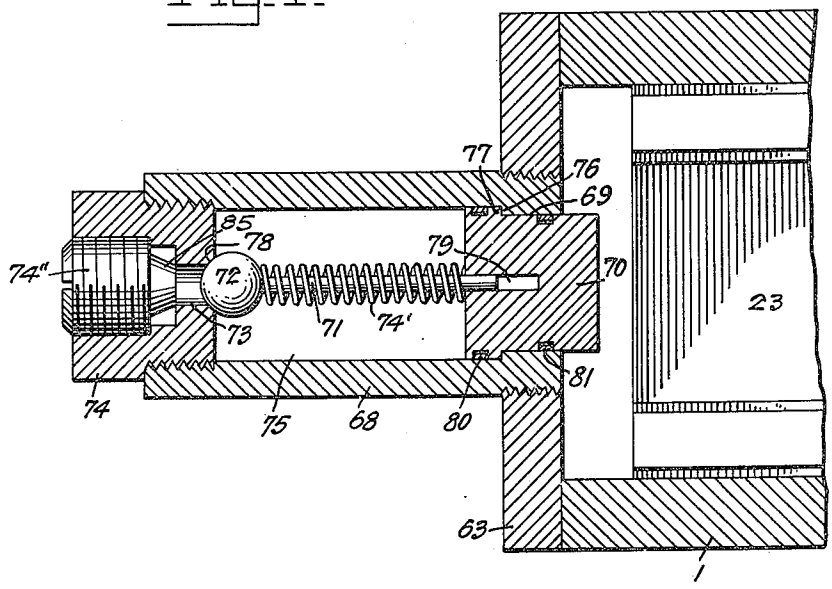
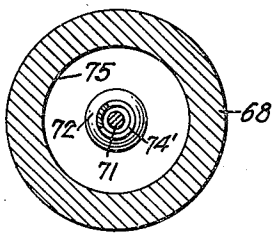


Fig. 2.



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Patented Feb. 7, 1950

2,496,323

UNITED STATES PATENT OFFICE

2,496,323

BUFFER

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Original application December 15, 1943, Serial No. 514,359. Divided and this application June 20, 1946, Serial No. 677,949

5 Claims. (Cl. 89—198)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

1

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to improvements in buffers, for absorbing the shock of recoil movement of the breech block in a machine gun, and represents a division of my application Serial No. 514,359 for Multpile barrel machine gun, filed December 15, 1943 and now Patent Number 2,410,848 dated November 12, 1946.

An object of the invention is to provide a buffer containing a fluid, such as air or gas, under pressure.

Another object of the invention is to provide a piston, in contact with the fluid and protruding into the path of a breech block, whereby the fluid is further compressed to check the breech block travel and initiate a counter-recoil movement thereof.

A further object of the invention is to provide a valve for filling the fluid chamber to any desired pressure, and replenishing such pressure lost under working conditions.

A still further object of the invention is to provide a buffer of simple and sturdy construction that will withstand the severe pressures inflicted upon it during operation of the gun.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a fragmentary longitudinal sectional view of the rear end of a machine gun receiver, showing my buffer attached thereto, and,

Figure 2 is a transverse sectional view of the buffer.

Heretofore it has been the practice to provide breech block buffers with flexible backing in the form of rubber blocks, springs, spring washers or oil dash pots, all of which are subject to deterioration and therefore require frequent disassembly of the buffer for replacement. Adjustment, if any, to working pressures is slight.

The present invention contemplates the use of fewer and sturdier parts, backed by a more flexible means, in the form of air or gas, into which power in stored by the recoiling breech block for a quick recovery into a counter-recoiling force.

In the event of any pressure loss, the cylinder may be quickly recharged with pressure from an outside source, which can be connected after the removal of the filling plug.

2

Referring now to the drawings, wherein for the purpose of illustration, a preferred embodiment of my invention is shown, the numeral 1 designates a portion of a machine gun receiver.

A breech block 23 is slidably mounted in the receiver and is driven in recoil and counter-recoil by any well known means, (not shown), or as shown in my patent hereinbefore identified.

The rear end of the receiver is closed by a plate 63. The plate is formed with a screw-threaded opening for attachment of a buffer which will now be described.

A single buffer cylinder 68 is provided with an externally screw-threaded portion for engagement with the threaded opening in the plate 63, and extends rearwardly therefrom. Centrally of its forward end the cylinder is provided with a bore 69 entering into a counter bore 75. The counter bore 75 forms a chamber for the fluid under pressure. These bores are concentric to each other and form a shoulder or seat 76 at their junction.

Slidable in the bore 69 is a stepped buffer piston 70, said piston having portion snugly but slidably fitting within the bore 69 and counterbore 75 and forming a stop or shoulder 77 shaped to effect a gas tight abutment with the shoulder 76 of the cylinder.

A screw plug 74 is threaded into the rear end of the cylinder 68 and has formed therein an orifice 73, closed at its outer end by a filling plug 74'', said orifice being formed with a valve seat 78 at its forward end for receiving a ball valve 72.

The ball valve 72 is held in alignment with its seat 78 by a rod 71 secured thereto and extending forwardly and into a central bore 79 formed in the piston 70. A spring 74', surrounding the rod 71 and interposed between the slidable piston 70 and the ball valve 72, holds the ball against its seat 78 to close the orifice 73, and also forces the piston shoulder 77 against its seat 76.

Air or gas, is confined in the buffer cylinder, introduced therein through the orifice 73, which is available for the introduction of such fluid upon removal of the threaded filling plug 74''.

The filling plug 74'' is formed on its inner face with a frustro-conical extension 85 whose inner end is concentric with the orifice 73, and is intended to seal the outer end of the orifice. This seal may be dispensed with if working pressures do not demand it.

In order to insure gas tight contact between the

inner surfaces of the cylinder bores **69** and **75** and the outer surfaces of the piston **70**, at all times, there are provided piston rings **80** and **81**, or any other suitable sealing means.

The operation of the buffer is as follows:

Just before the breech block reaches its final rearward position, to which it is forced by the gun gases or other means, (not shown), its rear end engages the forward end of the slidable buffer piston **70** which, yielding against the contained pressure in the cylinder, effects the buffing of the block. The increased pressure in the cylinder will initiate the counter recoil stroke of the block.

In use the buffer can be completely assembled and attached to the receiver of the gun, and at any convenient time the cylinder may be charged to the required pressure. This charging is accomplished by simply removing the filling plug **74''** and attaching a pressure line to the screw plug **74**, whereupon the valve **72** will be unseated and pressure will be admitted to the bore **75**. Likewise if the pressure is reduced below a workable degree, due to continued use or disuse, the operation can be repeated without disassembly or removal of the buffer from the gun.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, as defined by the subjoined claims.

Having thus described my invention, I claim:

1. A buffer structure comprising, a hollow cylinder for the reception of a compressed gas and having a slidable piston fitting gas-tight therein, said piston having a centrally disposed seat in its inner face, stop shoulders in the cylinder and on the piston for limiting the outward movement of the piston, an apertured plug at the other end of the cylinder, a valve seated in said aperture, said valve having a stem secured thereto and extending forward into the centrally disposed seat in the piston, and a spring surrounding said valve stem for normally seating the valve and the slidable piston.

2. In a buffer structure, the combination with a machine gun having a receiver and a reciprocating breech block of a hollow gas filled cylinder secured to the receiver in line with the path of travel of the breech block, a slidable piston fitting gas-tight in one end of the cylinder, stop shoulders in the cylinder and on the piston for engagement with each other to limit the outward movement of the piston, said piston having a centrally disposed seat in its inner face, an apertured closure plug at the other end of the cylinder, a valve seated in the aperture, said valve having a stem secured thereto and extending forward into the centrally disposed seat in the piston, and a spring surrounding said valve stem for exerting its pressure to normally seat the valve and project the piston outwardly of the cylinder and into the path of the reciprocating breech block.

3. A buffer gun structure for a gun having a receiver and a breechblock reciprocable therein, a cylinder secured in the rear wall of the receiver with the forward end of its bore opening into said receiver, a piston reciprocable in said cylinder

and having a central axial bore opening through the rear face thereof, a screw-plug closing the rear end of said cylinder and having an axially extending passageway, the forward end of said passageway forming a valve seat, and a valve in said cylinder to engage said seat to close said passageway, said valve including a stem having its forward end slidably fitting the bore in said piston.

4. A buffer for a machine gun having a receiver with a rear wall and a breechblock reciprocable therein, a cylinder secured in the rear wall with its forward end opening therethrough, a piston slidable in said cylinder said piston having a central axial bore opening through the rear face thereof, means limiting forward movement of said piston to a position in which the forward end thereof is engaged and moved rearwardly by the breechblock during the final portion only of its rearward reciprocation, a screw plug closing the rear end of said cylinder, there being an axial passageway through said screw plug having its forward end shaped to form a valve seat, a valve in said cylinder adapted to engage said seat, said valve including a stem slidably engaging the bore in said piston, and a coil spring surrounding said stem and bearing at one end on said valve and at the other end on said piston, said stem limiting the rearward reciprocation of the piston in the cylinder.

5. In a buffer structure for a gun having a receiver with a rear wall, a cylinder threaded into an aperture in said wall and having the bore in its forward end of reduced diameter to form a circumferentially-extending rearwardly-facing shoulder, a stepped piston having portions of different diameters each fitting a respective portion of said cylinder, said step engaging said shoulder to limit the forward movement of said piston in said cylinder, there being an axial bore in said piston opening through the rear face thereof, a plug closing the rear end of said cylinder, there being a gas passage in said plug having its forward end within said cylinder formed as a valve seat, a valve comprising a ball in said cylinder to engage said seat and close said passage, a radial stem extending from said ball and slidably fitting the bore in said piston to limit the rearward movement thereof, and a coil spring on said stem urging the ball onto said seat and the piston into forwardmost position.

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