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FROM RECOILLESS WEAPONS

3,489,058

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2 Sheets-Sheet 1

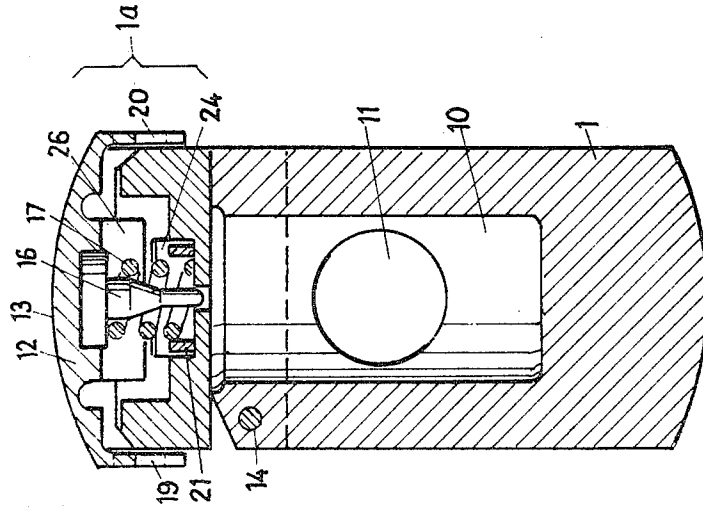


Fig 2

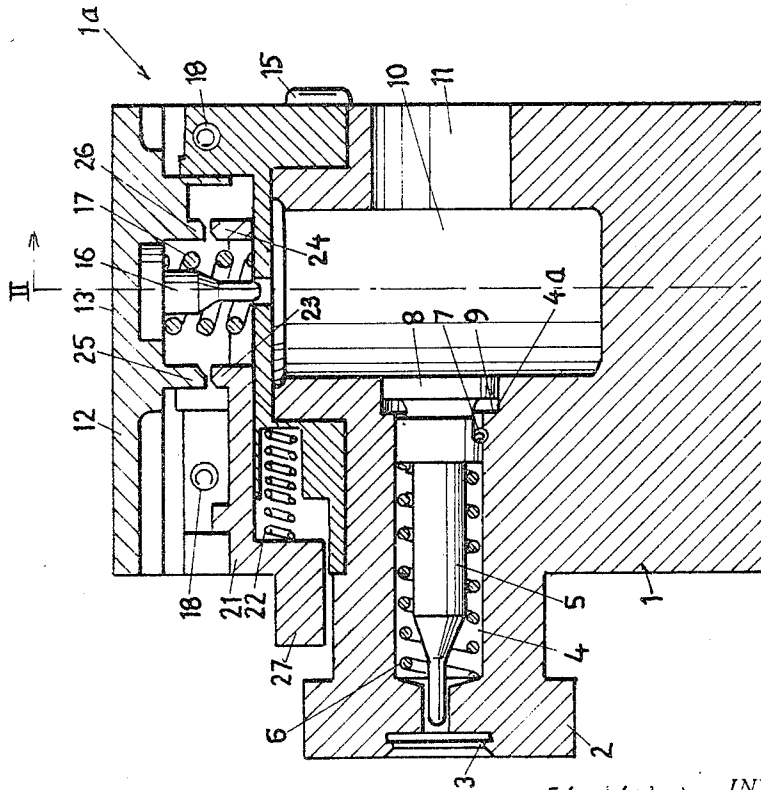


Fig 1

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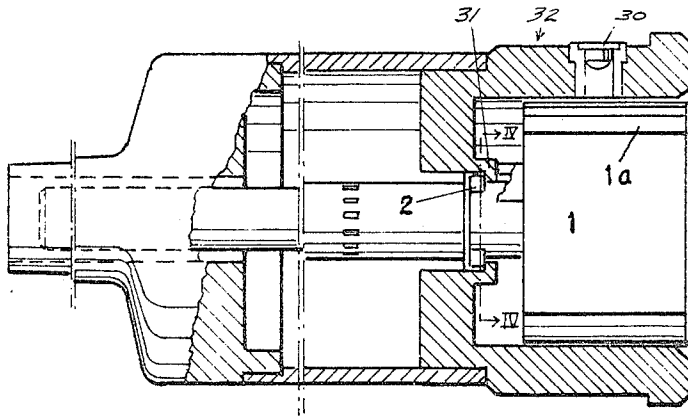


Fig. 3

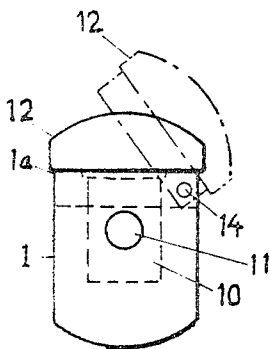


Fig. 6

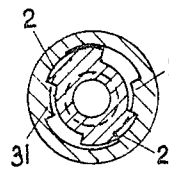


Fig. 4

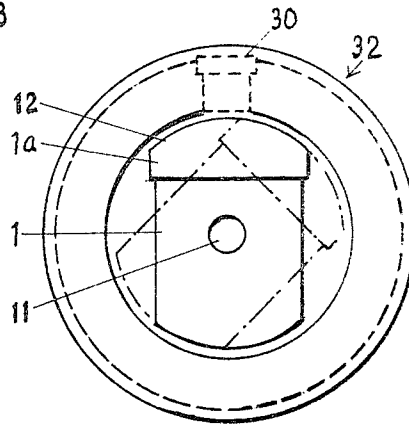


Fig. 5

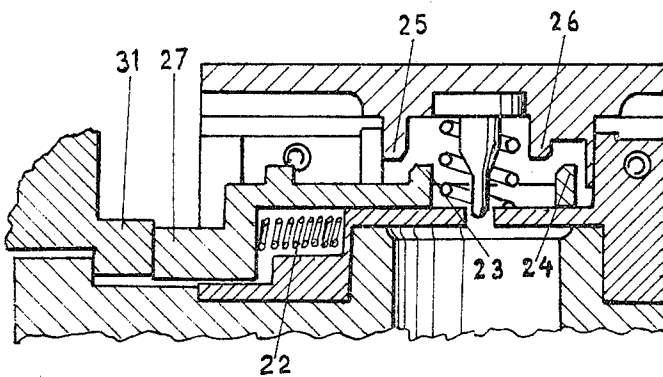


Fig. 7

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3,489,058

BREECH BLOCK FOR USE IN FIRING SUB-CALIBRE TRAINING CARTRIDGES FROM RECOILLESS WEAPONS

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6 Claims

ABSTRACT OF THE DISCLOSURE

A breech block for firing subcalibre cartridges from recoilless weapons, said breech block having a firing pin for the subcalibre cartridge which is actuated by an explosive charge in an auxiliary cartridge, there being a rearward opening from a chamber containing said auxiliary cartridge through which a rearwardly directed flame is fired in order to simulate the actual function of the weapon when it is fired with full calibre cartridges.

Description

The present invention relates to a breech block for use in training military personnel for firing recoilless weapons with side triggering.

An object of the present invention is to imitate the actual function of a recoilless weapon when it is fired with a full calibre cartridge.

In training personnel for firing recoilless weapons, one generally uses a special round or frame to be inserted in the barrel of the recoilless weapon, said round or frame comprising a subcalibre barrel. In said round or frame there is an easily removable breech block which is provided with a fastening means for the subcalibre training ammunition and with means for firing said ammunition. In known breech blocks of this kind, for example the breech block shown in the Swedish Patent 199,475, said firing means comprises at least one firing pin, a hammer, and a safety catch.

The present invention relates to a breech block which is provided with a cartridge chamber for an auxiliary cartridge which is adapted to actuate said firing pin to engagement with the subcalibre cartridge and by this means to provide a substitute for the hammer. According to the invention there is a rearwardly directed flame opening from said auxiliary cartridge chamber through which a rearwardly directed flame is being projected, in order to simulate the actual function of the recoilless arm when it is used together with ammunition of full calibre.

In the following, the invention will be described more in detail, references being had to the accompanied drawings, in which:

FIG. 1 is a longitudinal section of a breech block according to the invention, and

FIG. 2 is a transversal section of said breech block along the line II—II in FIG. 1,

FIG. 3 is a section through a cartridge receiving frame or round to be used in a recoilless arm, with a breech block according to the invention, said round comprising a barrel for a subcalibre cartridge,

FIG. 4 is a section along the line IV—IV in FIG. 3, as viewed in the direction of the arrows,

FIG. 5 is a view from the rear of the device shown in FIG. 3 and illustrating the breech block in a safety and a non-safety position,

FIG. 6 is a rear view of the breech block illustrating two different positions of a tiltable side portion of said breech block, and

FIG. 7 is a longitudinal section through the upper half of the breech block illustrating a safety device in its non-safety position.

In the drawings, the breech block is designated 1. Said breech block is provided with a flange 2 at the front end thereof, said flange 2 forming one part of a bayonet fixing, as will be apparent from FIG. 4, and serving for keeping the breech block fastened in a special round or frame 32, as will be described in connection with FIGS. 3 and 4, said round or frame 32 being in turn adapted to be inserted in the rear end of a recoilless weapon. In said flange 2 there is a fitting 3 for keeping a subcalibre training cartridge and behind said fitting 3 there is a longitudinal bore 4 for a firing pin 5. The firing pin 5 is kept in a rear, rest position by a helical spring 6, against a stopper 7. At its rear end, the firing pin 5 is provided with a flange 8 located in an enlarged portion 4a of the bore 4, said enlarged portion 4a having a length exceeding the axial length of the flange 8.

The movement of the firing pin 5 is thus limited to the distance between the flange 8 and the annular surface 9 between the bore 4 and the enlarged portion 4a. The breech block is provided with a laterally open chamber 10, said chamber having the shape of a cylindrical transverse bore, the central line of said chamber 10 being located in the same plane as the central line of the bore 4, but disposed at a right angle to the latter. The chamber 10 is intended to receive an auxiliary cartridge, not shown, the envelope of which being made of a flexible, plastic material and having a mantle wall which engages the rear end surface of the flange 8 of the firing pin 5. Behind the cartridge chamber 10, the breech block is provided with a bore 11 which communicates with the cartridge chamber 10 and forms a rearwardly directed opening from the chamber 10. The bore 11 is coaxial with the bore 4. The lateral opening of the chamber 10 is covered by a side portion 1a comprising a number of parts which are kept together. The outermost member 12 of said side portion 1a has the shape of a cap which partly covers the other parts and has an outer surface 13 which is matched to the cylindrical, inner surface of the opening in the round 32, FIG. 3, in which the breech block is intended to be inserted. Said side portion 1a is pivoted about an axis 14. Therefore, when the breech block is removed from said round 32, said side portion 1a can be tilted open to uncover the lateral opening of the chamber 10, in order to facilitate changing of the auxiliary cartridge received in the chamber 10. In the cap-shaped member 12, a second firing pin 16 is located, the igniting tip of which is located just in the centre of the opening of the chamber 10. Said second firing pin 16 is adapted to ignite the auxiliary cartridge received in said chamber 10. The cap-shaped member 12 is arranged to be displaced inwardly together with the firing pin 16 against the force of a helical spring 17, surrounding said firing pin 16. This displacement is a parallel displacement of the member 12, and for that purpose, the member 12 is guided by means of two guiding pins 18 which are fastened in an inner part belonging to the tiltable side portion 1a and which are freely penetrating slots 19, 20 in the side parts of the cap-shaped member 12. The guiding pins 18 are shaped as slotted, tubular members which are forced into bores in said inner part and kept in place by spring action of said tubular members.

By turning the breech block, the latter can be moved into one or the other of two positions, one of which is a safety position and the other is a non-safety position. In the non-safety position shown in full lines in FIG. 5, the cap-shaped member 12 is located under a detonating cap 30 which is adapted to be actuated by a lateral trig-

gering device belonging to the recoilless weapon. The cap-shaped member 12 is arranged to be pressed inwardly by the gas pressure developed by said detonating cap 30. However, when the breech block is turned to the safety position shown in dash-dotted lines in FIG. 5, the cap-shaped member 12 is located laterally of said detonating cap 30. In this position, firing of the recoilless weapon will not result in any displacement of the member 12 and, therefore, does not result in ignition of the auxiliary cartridge received in the chamber 10.

When the breech block is removed from the round 32, said breech block has to be put to safety condition against firing, which means that inward pressure of the cap-shaped member 12 should be prevented. A safety catch is provided by an inner member 21, belonging to the tiltable side portion 1a. The member 21 is slidable in the longitudinal direction of the breech block. When the breech block is removed from said frame, the member is kept in the safety position illustrated in FIG. 1, by a helical spring 22. In this position two projections 23, 24 are located opposite to two corresponding projections 25, 26 belonging to the cap-shaped member 12, and by this means the cap-shaped member 12 with the firing pin 16 can not be displaced inwardly. When the breech block is inserted into the frame or round 32, a projection 27 belonging to the member 21 will engage a part 31 (FIG. 7) belonging to the round 32. Therefore, the member 21 will be pushed backwards against the action of the spring 22 to a position where the projections 23, 24 are displaced to the right from the position shown in FIG. 1 to the position shown in FIG. 7. In this position, the safety device is inactive because the projections 23, 24 are no longer located in alignment with the projections 25, 26.

In operation, the chamber 10 is open and freely accessible when the breech block is removed from said frame 32 and when the side member 1a of the breech block is tilted up to the position shown by dash-dotted lines in FIG. 6. In this position, a cartridge may be inserted into the chamber 10 and, thereafter, the side portion 1a may be clasped down to the position shown in FIGS. 1 and 2. In this position, the member 12 is, however, prevented from being pressed inwardly and, therefore, the cartridge received in the bore 10 cannot be ignited in this position. A subcalibre cartridge is then inserted into the fitting 3 and the breech block is inserted into the round 32 and pressed inwardly and turned to a fixed position, whereby the safety device is made inactive as described in the foregoing. Before firing the weapon, the breech block is further turned to the position in which the cap-shaped member 12 is located under the detonating cap 30 in the round 32, as shown in full lines in FIG. 5. By ignition of the detonating cap 30 by actuating the triggering device of the recoilless weapon, a gas pressure is developed, which is sufficient to rapidly press the member 12 inwardly and thereby also to press the firing pin 16 against the ignition cap of the auxiliary cartridge received in the chamber 10, so that the gunpowder in said cartridge will be ignited. The gas pressure developed in the chamber 10 expands the flexible mantle wall of the auxiliary cartridge envelope into the opening of the bores 4 and 11. The firing pin 5, the rear end surface of which is in contact with the auxiliary cartridge in the chamber 10, will now be pushed forwards, so that the left part of said firing pin will strike against the ignition cap of the subcalibre cartridge inserted into the fitting 3. Immediately thereafter the mantle wall of the auxiliary cartridge in the chamber 10 will be broken through where the bore 11 opens into the chamber 10. When this occurs, however, the gunpowder gases are exhausted rearwardly through the bore 11 and the report obtained from that exhaustion is considerably more powerful than the report from the firing of the subcalibre cartridge attached to the fitting 3. In addition to that, a flame will be projected rearwardly.

After firing, the breech block can be removed from the round 32 and, thereafter, the empty subcalibre cartridge attached to the fitting 3 and the rest of the plastic envelope of the cartridge in the bore 10 are removed and new cartridges are inserted in the said locations. The breech block may again be inserted into the round 32 and, thereafter, the training weapon is again ready for use.

The training weapon may also be used charged with only the auxiliary cartridge received in the chamber 10 for blank firing exercise.

What we claim is:

1. In a breech block for a sub-calibre training cartridge for insertion longitudinally into the barrel of a recoilless weapon comprising, a main body member having a generally prismatical shape in its longitudinal direction, said main body member having a radial bore extending from one side of the member and past its longitudinal center, said bore forming a chamber for a fire-indicating cartridge containing a fire-indicating charge and having an envelope having a mantle wall composed of flexible material, said member having a further first central longitudinal bore extending from the radial bore to the rear end of said member, said member having a second central longitudinal bore extending from said radial bore to the front end of the member, a fitting for receiving a sub-calibre training cartridge where said second longitudinal bore terminates at the front end surface of said member, a firing pin slidably located in said second longitudinal bore, said firing pin having a tip at its front end, said tip being directed toward the ignition cap of a sub-calibre cartridge that is inserted in said fitting, a spring for urging said firing pin rearwardly away from the sub-calibre cartridge fitting, a piston portion at the rear end of the firing pin, the rear end of the piston portion being flush with the inner wall surface of said radial bore when the firing pin is kept in its rearmost position, a side portion mounted outside said main body member and covering the opening of said radial bore, an auxiliary firing pin in said side portion, said second firing pin having a tip directed toward the ignition cap of the indicating cartridge in said radial bore, a spring for urging said auxiliary firing pin away from said indicating cartridge, a cap-shaped member belonging to said side portion and being displaceable radially inwardly, said cap-shaped member engaging said auxiliary firing pin, said cap-shaped member forming a part of the outermost mantle surface of the breech block, said cap-shaped member being pressed inwardly by a side firing device of the recoilless weapon and upon such pressure actuating said auxiliary firing pin to ignite the auxiliary cartridge, whereupon the flexible mantle wall of the said cartridge will bulge forwardly into the second longitudinal bore and press the first firing pin toward the ignition cap of the subcalibre cartridge, the explosion of the fire-indicating charge further causing the flexible mantle wall of the fire-indicating cartridge to break through into said first longitudinal bore and allow burning combustion gases to be thrown out backwardly from said breech block, thus audibly and visually indicating the firing.

2. In a breech block according to claim 1, hinges connecting said side portion to said main body member for allowing said side portion to be tilted open to free the opening of said radial bore for enabling the exchange of said auxiliary cartridge to be made.

3. In a breech block according to claim 1, a cylindrical frame in which the assembly, comprising the said main body member and said side portion are inserted, said frame being insertable in the barrel of said recoilless weapon, an outer ignition cap in the mantle surface of said frame for actuation by the side firing device of said recoilless weapon, a radial channel from said ignition cap to said side portion of said assembly when said assembly is inserted in said frame, said channel allowing

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the combustion gases from said outer ignition cap to press said side portion inwardly.

4. A breech block according to claim 3, in which said assembly of the main body member and the side portion are rotatable in said frame from an active position wherein said side portion registers with the opening of said radial chamber, to a safety position wherein said side portion is displaced from the opening of said channel.

5. In a breech block according to claim 4, wherein a bayonet fitting is employed for locking said assembly in said frame, said locking taking place in said active and safety positions, but said assembly being unlocked and removable from said frame when in a position beyond either of said active or safety positions.

6. In a breech block according to claim 5, including a slidable member between said cap-shaped member and said main body member, said slidable member being kept in a safety position, a spring for keeping said member in such position when said assembly is removed from said frame, said slidable member having projections which, in said safety position, registered with corresponding projections on said cap-shaped member and prevent the latter

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from being pressed inwardly, a projection on said slidable member which engages a projection on said frame when said assembly is inserted in the frame and causes the slidable member to be displaced against the action of said spring to a position where the said projections on the slidable member are outside of the path of movement of the corresponding projections on said cap-shaped member.

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SAMUEL W. ENGLE, Primary Examiner

U.S. Cl. X.R.

89—29; 102—41