Aug. 4, 1925. 1,548,708

J. M. BROWNING

RECOIL BUFFER FOR AUTOMATIC GUNS

Filed Sept. 24, 1923

Fig. 1

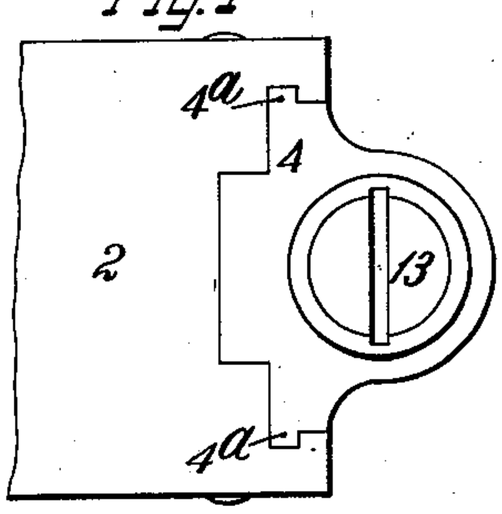


Fig. 2

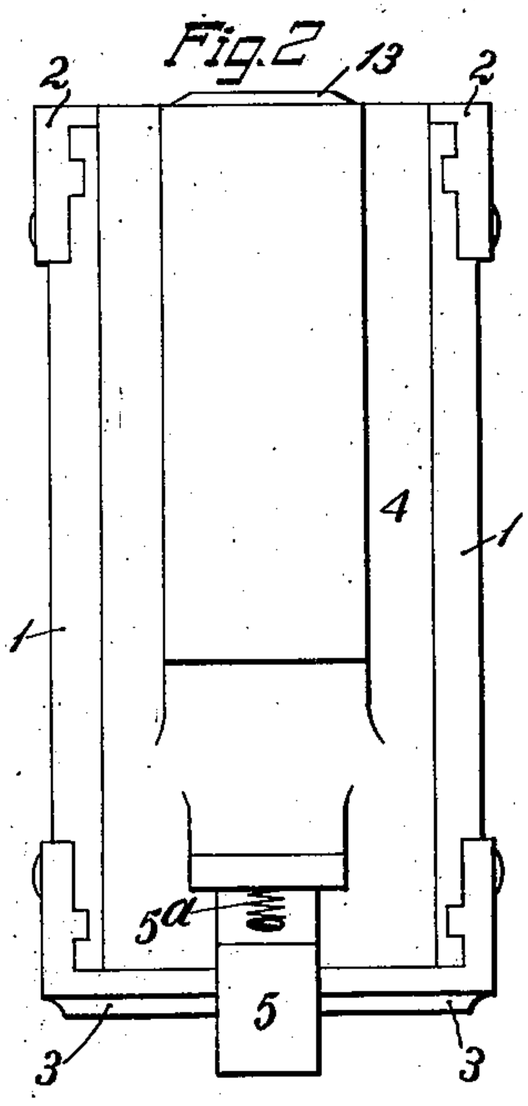


Fig. 3

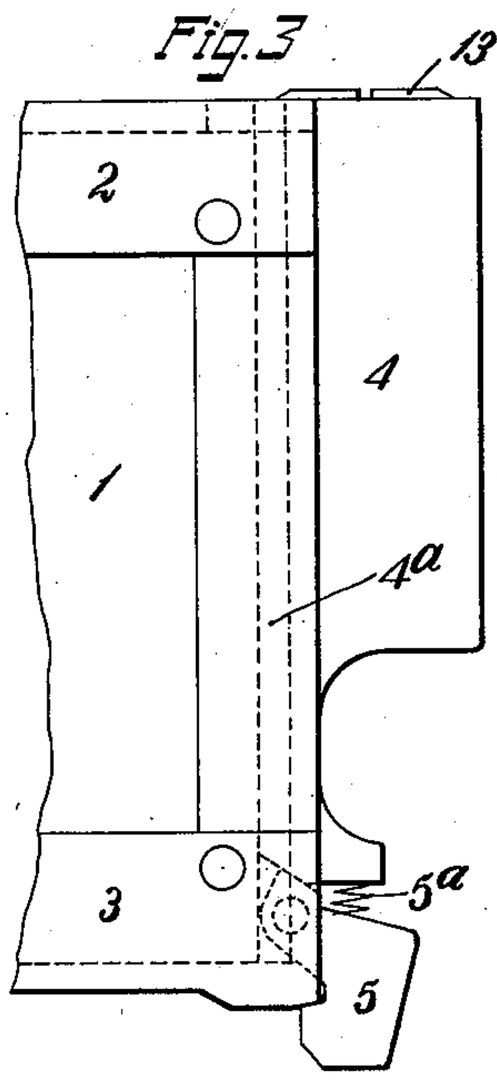
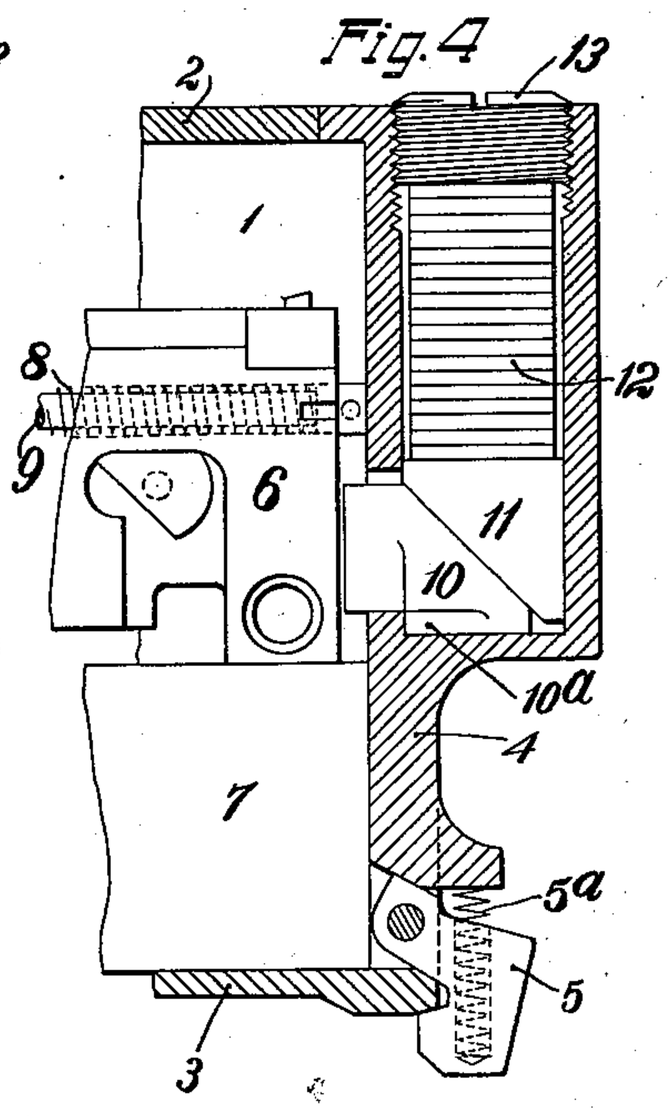


Fig. 4



Inventor

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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

RECOIL BUFFER FOR AUTOMATIC GUNS.

Application filed September 24, 1923. Serial No. 664,509.

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, a citizen of the United States, residing at Ogden, in the county of Weber and State of Utah, have invented certain new and useful Improvements in Recoil Buffers for Automatic Guns, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

My invention relates generally to automatic guns having a heavy longitudinally recoiling member, such as a breech block, and more particularly to a novel improved buffer for cushioning the blow of such member at the end of its recoil.

The main object of my invention is to provide a recoil buffer for automatic guns which is of compact and rugged construction, durable, efficient in operation, and easy of manufacture.

This object is attained by the features of construction illustrated in the accompanying drawings in which:

Fig. 1 is a top view of the rear portion of a machine gun having my invention applied thereto;

Fig. 2 is a rear end view of said gun;

Fig. 3 is a side elevation of the rear portion of said gun; and

Fig. 4 is a central vertical longitudinal section through the rear portion of the breech casing of said gun showing the breech block near the end of its recoil.

In the drawings, the breech casing of the gun comprises side plates 1, 1, the top plate 2 and the bottom plate 3 all rigidly and permanently interconnected to provide a strong hollow structure for receiving the breech mechanism.

At the rear the breech casing is closed by the rear plate 4, which slides downward in mounting it and upward in dismounting it, between the side plates 1, 1 of the casing. During these movements the rear plate is guided by a rib 4^a, see Fig. 1, on each of its sides fitted into a corresponding groove in each of the side plates of the casing. At the top, the rear plate has a forwardly projecting transverse flange, see Figs. 1 and 4, which fits in a corresponding recess in the top plate 2. The rear plate 4 is locked in its lower closing position by the latch 5 pivoted therein on a transverse pin, said latch having a forward extension engaging under the rear end of the bottom plate 3. The spring 5^a normally keeps the latch in its locking position.

Within the breech casing, the breech block 6 is mounted for longitudinal reciprocating movement, being slidably supported near its rear end, upon the stationary breech block guide 7. During its recoil the breech block compresses the reaction spring 8, the forward end of which (not shown) transmits the tension of said spring to the breech block, while the rear end transmits its tension to the rear plate 4 through the guide rod 9 about which the spring is coiled and against a shoulder on which its rear end bears, see Fig. 4.

To cushion the blow of the breech block at the end of its recoil, the rear plate 4 is provided with my improved buffer; for this purpose, the rear plate has a central rearward bulge extending in vertical direction from approximately the horizontal plane of the top of the breech block guide 7 to the top of the rear plate 4, thereby providing a thickened portion of said plate. A chamber whose axis extends transversely to the line of movement of the breech block and preferably at an angle of substantially 90° to said line of movement, is provided in this thickened portion to receive the cushioning means for the breech block, and near the inner end of this chamber, an opening is provided in its forward wall. Through this opening the horizontally movable buffer block 10 projects forward some distance, its forward end being thus in position to be struck by the rear end of the breech block at the end of its recoil.

This buffer block 10 has a downward projection 10^a within the buffer chamber, said projection resting upon the bottom of the chamber to support the rear end of the block 10, while the forward face of said downward projection forms a shoulder to limit the forward movement of said block. The portion of the block 10 within the chamber is formed at the top with a rearward and downward inclined surface, which in the preferred form of the invention shown, makes an angle of substantially 45° with the direction of movement of said block. This surface contacts with a corresponding surface on the under side of the transversely sliding block 11, which fits within the chamber in the rear plate and has a flat horizontal outwardly facing surface, see Fig. 4. Within the chamber above the

block 11 is arranged any suitable elastic means, such as the compressible fiber disks 12, which are kept under some compression between the block 11 and a screw plug 13 closing the outer end of the buffer chamber. By adjusting the screw plug 13, the elasticity of the disks may be varied, thus varying the action of the buffer.

The operation of the novel improved buffer will now be described. When the breech block, in recoiling, moves rearward from the position shown in Fig. 4, its rear end strikes the front face of the buffer block 10 and drives it rearward. The rear portion of the block 10 being held against downward movement by the bottom of the chamber in the rear plate, thus, through the co-operation of the inclined surface thereon with the corresponding surface on the block 11, forces said block 11 in a transverse direction, thereby compressing the elastic disks 12, and in this manner cushioning the blow of the breech block.

When the breech block has thus been brought to a stop, it is at once returned forward under the combined action of the reaction spring 8 and the buffer, the parts of which are then returned to their original position by the elastic disks 12, where they are ready to cushion the next succeeding blow of the breech block.

By the construction and arrangement of the parts hereinbefore described, the action of the elastic disks 12 in bringing the breech block to rest is supplemented by the braking action resulting from the frictional engagement of the buffer blocks 10 and 11 with each other and with the bottom and rear walls of the buffer chamber, respectively. This braking action also renders the buffer comparatively "dead", that is, it prevents a too rapid expansion of the disks 12 or other resilient means in returning the buffer blocks 10 and 11 to their normal position, thereby avoiding a too violent forward return of the breech block or other recoiling member.

While I have hereinbefore described the buffer chamber as preferably extending transversely substantially at right angles to the direction of the breech block, I do not wish to be limited to this precise angular relation, since it will be obvious to those skilled in the art that said chamber may be inclined rearwardly and outwardly at a substantial angle to the right-angular position shown and still come within the spirit and scope of my invention as set forth in the claims.

What I claim and desire to secure by Letters Patent is:

1. In an automatic gun, the combination of a recoiling member and a buffer therefor supported in a seat whose longitudinal axis extends transversely to the direction of movement of said recoiling member, said buffer comprising yielding means and a pair of blocks, said yielding means backing one of said blocks which has an inclined surface in contact with a similar surface on the other of said blocks, said last-named block being in position to be struck by said recoiling member as said member nears the limit of its recoil movement.

2. In an automatic gun, the combination of a recoiling member and a buffer therefor supported in a chamber whose longitudinal axis extends transversely to the direction of movement of said recoiling member, said buffer comprising yielding means and a pair of blocks, said blocks having inclined contacting surfaces and also surfaces having frictional contact with the walls of said chamber, one of said blocks being backed by said yielding means, and the other of said blocks being in position to be struck by said recoiling member as said member nears the limit of its recoil movement.

3. In an automatic gun, the combination of a casing having a rear wall, a member mounted for longitudinal reciprocating movement in said casing, and a buffer carried by said rear wall, said buffer comprising a block mounted for longitudinal movement, a second block mounted for transverse movement, inclined contacting surfaces on said blocks, respectively, and elastic means opposing movement of said transversely movable block.

4. In an automatic gun, the combination of a recoiling member, a block adapted to be struck by said member near the end of its recoil movement, said block being guided for longitudinal movement in the same direction as said member and having an inclined surface, a second block guided for transverse movement at an angle to the direction of movement of said first named block and having a correspondingly inclined surface contacting with the inclined surface on the first named block, and elastic means backing said second named block.

5. In an automatic gun, the combination of a casing having a rear wall, a member mounted for longitudinal movement in said casing, and a buffer carried by said rear wall for cushioning the last of the rearward movement of said member, said buffer comprising an element movable in a direction parallel to the direction of movement of said member, a second element movable transversely to the direction of movement of said member, inclined contacting surfaces on said elements, respectively, and elastic means backing said second named element.

6. In an automatic gun, the combination of a casing having a rear wall, a member mounted for longitudinal movement in said casing, and a buffer carried by said rear

wall, said buffer comprising a block mounted for longitudinal movement, a second block mounted for transverse movement, inclined contacting surfaces on said blocks, respectively, elastic means opposing outward movement of said transversely movable block, and a device for adjusting the elasticity of said means.

7. In an automatic gun, the combination of a breech casing having a rear wall, a recoiling member in said casing, and means for cushioning the blow of said member as it nears the limit of its recoil, said means comprising a block movable in a direction parallel to the direction of movement of said member and adapted to be struck by said member, a second block movable substantially at right angles to the direction of movement of said first named block, contacting surfaces on said blocks, respectively, inclined at an angle of substantially 45° to the direction of movement of said recoiling member, and elastic means backing said second named block.

8. In an automatic gun, the combination of a recoiling member and a buffer at the rear of said member, said buffer comprising a casing enclosing a longitudinally movable block adapted to be struck by said recoiling member, said block being formed at its rear with an incline adapted to engage a corresponding incline on a second block movable transversely to the direction of movement of said first block, and resilient means backing said second block, whereby a blow on the first block will tend to compress said resilient means and force said second block against the side of said buffer casing to exert a braking action.

9. In an automatic gun, the combination of a recoiling member and a buffer at the rear of said member, said buffer comprising a casing, a longitudinally movable block normally seated on the bottom of said casing and projecting therefrom in position to be struck by said recoiling member, said block being formed at its rear with an incline, a second block within the casing having a corresponding incline in frictional contact with said first incline and a face in frictional contact with one side of the casing, and resilient means backing said second block, whereby a blow on said first block will tend to compress said resilient means and whereby the frictional contact between said blocks and the bottom and side of the casing will exert a braking action.

This specification signed and witnessed this 14th day of Sept. A. D. 1923.

JOHN M. BROWNING.

In the presence of—
CHRISTIAN PFEIFFER,
HOWARD A. TRENN.