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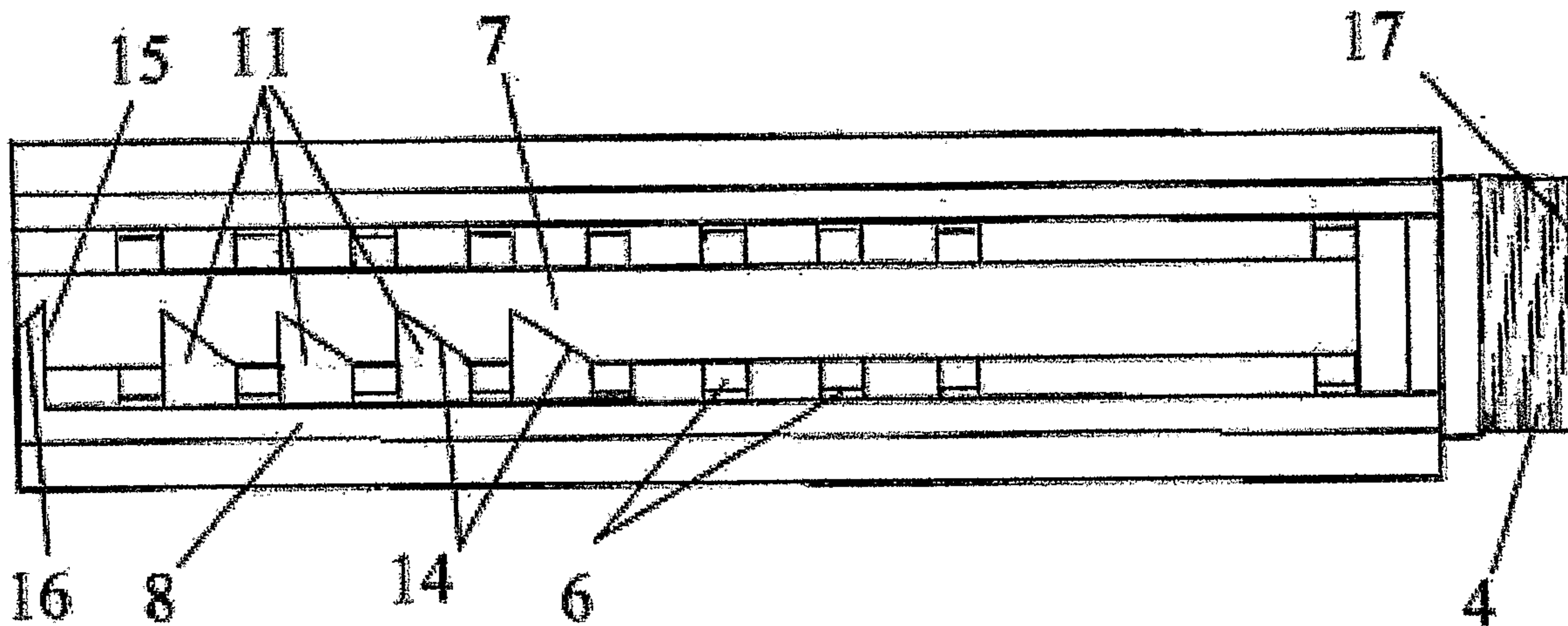
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(54) Title: BUFFER TUBE FOR MODULAR GUNSTOCK



(57) Abrégé/Abstract:

The present invention is a buffer tube assembly (2) upon which stock modules may be mounted as part of a modular stock system. The best mode buffer tube features a uniform cheek plate (10) with a track (9) disposed underneath the cheek plate (10) on either side. Rail track (8) is disposed on the underside of buffer tube module (2) and is divided in half by a longitudinal groove. Interface detents (5) are provided on the sides of buffer tube module (2). Both rail track (8) and detents (5) are provided for interface with adjustable length stock modules. Individual half-rails of the rail track (8) may be angled to improve interface performance with adjustable for length stock modules. A clip hole (13) is provided as a securement means with fixed length stock modules. The invention may also be practiced as a mounting assembly for those firearms (usually air projection type) that do not require a buffer area.

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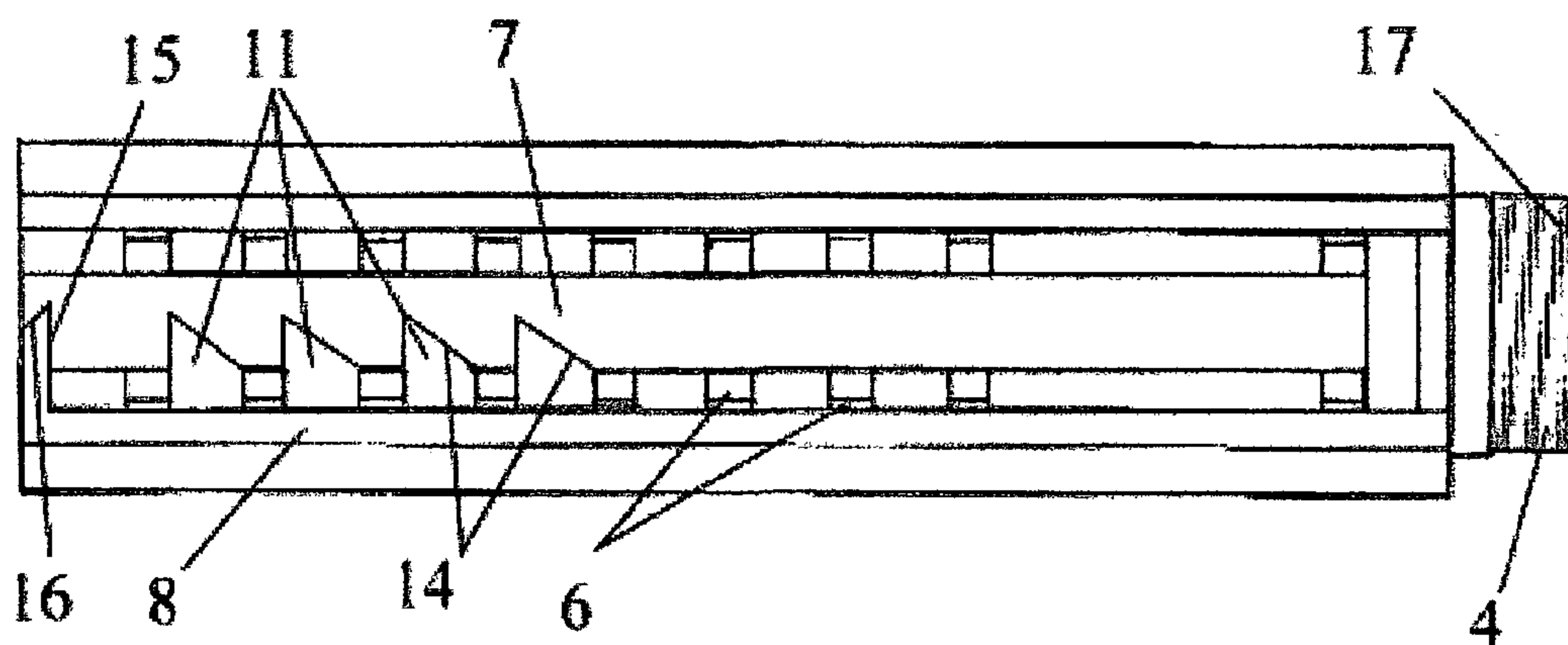
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(72) Inventors: FITZPATRICK, Richard [US/US]; 6816 North 95th Street, Longmont, CO 80504 (US). HINES, Stephen [US/US]; P.O. Box 423, Tijeras, NM 87059 (US). For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: BUFFER TUBE FOR MODULAR GUNSTOCK



(57) Abstract: The present invention is a buffer tube assembly (2) upon which stock modules may be mounted as part of a modular stock system. The best mode buffer tube features a uniform cheek plate (10) with a track (9) disposed underneath the cheek plate (10) on either side. Rail track (8) is disposed on the underside of buffer tube module (2) and is divided in half by a longitudinal groove. Interface detents (5) are provided on the sides of buffer tube module (2). Both rail track (8) and detents (5) are provided for interface with adjustable length stock modules. Individual half-rails of the rail track (8) may be angled to improve interface performance with adjustable for length stock modules. A clip hole (13) is provided as a securement means with fixed length stock modules. The invention may also be practiced as a mounting assembly for those firearms (usually air projection type) that do not require a buffer area.

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TITLE**BUFFER TUBE FOR MODULAR GUNSTOCK****CROSS-REFERENCES TO RELATED APPLICATIONS AND PATENTS**

This application is a Continuation-in-Part application of United States Patent Number 6,651,371, issued on November 25, 2003.

TECHNICAL FIELD

The invention relates to the field of buffer tubes for firearms, and more specifically is a buffer tube adapted for a modular gunstock to be used on traditional powder and non-powder based firearms.

BACKGROUND ART

The concept of a buffer tube is known in the field of gunsmithing, particularly for bolt-action firearms. The buffer tube is a hollow area that may be immediately and distally disposed from the firing chamber and allows for the reduction of the reactive force, known commonly as "kick," caused by the recoil of the firing bolt assembly. Buffer tubes for automatic rifles are usually concealed within the weapon's stock. For example, U.S. Pat No. 5,909,002 (1999) is illustrative of the prior art, depicting such a buffer tube assembly. Other buffer tube assemblies, particularly those for shotguns, are mounted beneath the barrel.

While the aforementioned inventions accomplish their individual objectives, they do not describe a buffer tube that serves both as a buffer assembly and a mounting arm for a modular stock assembly. In this respect, the buffer tube according to the present invention departs substantially from the usual designs in the prior art. In doing so, this invention provides not only the recoil reduction found in standard designs of buffer tubes in the art, but also a specific mounting apparatus for interchangeable stocks for a firearm. The assembly also may be adapted to fit non-powder (i.e. air) based weapons.

DISCLOSURE OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of buffer tubes, this invention provides an improved buffer tube as a part of a modular stock system. As such, the present invention's general purpose is to provide a new and improved buffer tube that will provide an anchor for a modular stock system. Similarly, the present invention also provides a uniform mounting platform for a modular stock system for non-bolt-type guns, such as air rifles or shotguns.

To attain these goals, the invention is a generally oblong body designed to interface with a weapon's receiver. The interface used by the mount will be dependent on the receiver. In most cases, the interface will be a threaded interface. For firing-bolt-type firearms and others requiring a buffer region, the mount includes a hollow buffer region, for the installation of whatever prior art recoil reduction the weapon requires. Where the mount differs from the prior art is primarily the use of a uniform cheek plate, on the upper surface of the mount. In order to attain this feature, the mount includes two longitudinal tracks, located in a distal relation to the cheek plate. Stock modules designed for this system attach to the mount by these tracks and do not cover the cheek plate. A more advanced embodiment includes an adjustment track located on the underside of the mount. The adjustment track allows for the use of adjustable-for-length stock modules and can, in a still further advanced embodiment, provide a securement safety feature.

The more important features of the invention have thus been outlined in order that the more detailed description that follows may be better understood and in order that the present contribution to the art may better be appreciated. Additional features of the invention will be described hereinafter and will form the subject matter of the claims that follow.

Many objects of this invention will appear from the following description and appended claims, reference being made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1a is the rifle of FIG. 1 with an adjustable stock attachment.

Figure 1b is the rifle of FIG. 1 with a fixed stock attachment.

Figure 1c is the rifle of FIG. 1 with a “shorty” fixed stock attachment

Figure 2 is a bottom plan view of the modified buffer tube module.

Figure 3 is a side elevation of the modified buffer tube module.

Figure 4 is a cross section of the buffer tube module of FIG. 3 taken at line 4.

Figure 5 is a three staged side elevation showing the use of the adjustable stock embodiment.

Figure 6a and 6b are side elevational views of the modified buffer tube module from FIG. 3, detailing an adjustable tube length embodiment.

Figure 6c is a cross-sectional view of the buffer tube module of FIG. 6b.

Figure 7 is a cross-sectional view of the modified buffer tube from FIG. 3, as a simple mount with no buffer region.

Figure 8 is a depiction of a user with a prior art collapsible stock.

Figure 9 is a depiction of a user with an adjustable for length stock using the buffer tube module of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

With reference now to the drawings, the preferred embodiment of the buffer tube is herein described. With reference to FIG. 1, the buffer tube module 2 is attached to rifle 1 at the receiver by the buffer tube 4 (FIG. 2) at an interface 17. Buffer tube module 2 has two distinct surfaces. The first is top surface is covered with cheek plate 10. Two longitudinal grooves 9, shown in FIG. 4, are disposed slightly underneath cheek plate 10 providing attachment grooves for stock module 12. The second is the bottom surface, FIG. 2, which is covered with rail track 8. Rail track 8 is also used for interfacing with stock modules 12, such as the one shown in FIG. 1a, namely an adjustable for length stock. Clip hole 13 is provided for a clip attachment with a fixed length stock, such as those shown in FIGS. 1b and 1c. In addition, referencing FIGS. 2, 3 and 4, rail track 8, with individual lateral grooves 6 and single transverse groove 7, is disposed towards the ground and cheek plate 10 is disposed upwards and is generally parallel to buffer tube 4. Ideally, the cheek plate 10 is fused onto the buffer tube 4. However, in alternative embodiments, enough space can be left between buffer tube 4 and cheek plate 10 to allow for unhindered motion of a cylindrical stock module. Tooth interfaces 5 are disposed underneath the longitudinal grooves 9.

A more detailed look at the buffer tube, particularly FIGS. 2 and 3, reveals that rail track 8 is bisected by channel 7, leaving half-rails 11. This is to allow for a ratcheting securement system with the stock modules as described in the parent and related applications. These applications,

include an interface tooth that moves laterally with respect to the buffer tube and stock modules. The leading edge 14 of the half-rails may be angled. The angled rail edges 14 allow for motion backwards, without difficulty. For purposes of this Application, the angled edges are defined as oblique to the buffer tube interface 17. The final rail 15 is angled in the opposite direction 16, or acute to the interface 17, preventing the stock module from being pulled off the tube module and allowing easier initial mounting of the stock module to the buffer tube module.

In use, the buffer tube module provides a mount for stock module 12, shown in FIGS. 1 and 5. Stock modules will have a receiving cradle 18 and an actual stock portion 20. Cradle 18 allows cheek plate 10 to remain exposed and constant regardless of the stock module used. It also remains constant with an adjustable stock, as shown in FIG. 5. Stock module 12 may be positioned at any length and cheek plate 10 remains constant. FIG. 5 also depicts the latching mechanism 22a, 22b, 22c at three different stages of contact with the rail track 8, allowing for no motion, unilateral motion and free motion respectively.

Figures 6a and 6b depicts a buffer tube module with an adjustable length buffer tube. End cap 60 is threadingly engaged to the inside of the buffer tube 4, shown in FIG. 6c. The end cap 60 may then be screwed into or out of the buffer tube 4 to the weapon's specifications. End cap 60 may be configured in any manner that threadingly engages the buffer tube 4, including configurations that entirely fit inside the buffer tube (for shortening the length of the buffer region 62) or the extension embodiment, with hollow extension area 74, shown in FIGS. 6a-6c

Figure 7 shows the buffer tube module as a mounting module for weapons not requiring a buffer area. As can be seen in the cross section, what would normally be hollow is instead a solid or semi-solid mounting module 70. A small area 72 may be included for compressed air or ease of manufacture.

Figure 8 shows the prior art adjustable stock configuration. Notice that user 80 places cheek 82 against the weapon 84. Cheek 82 is positioned against the juncture of the fore 86 and hind 88 portions of the stock. This not only causes discomfort but also interferes with the use of the weapon. Figure 9 shows use of the buffer tube of the present invention with an associated stock module. User's cheek 82 is now placed against cheek plate 10, eliminating discomfort and minimizing disruption caused by placement at the juncture as in the prior art.

Although the present invention has been described with reference to preferred embodiments, numerous modifications and variations can be made and still the result will come

within the scope of the invention. No limitation with respect to the specific embodiments disclosed herein is intended or should be inferred.

INDUSTRIAL APPLICATION

The invention is readily practiced in the field of weapons technology, as it can replace the buffer tube of any firearm requiring a buffer region and may be used with no internal buffer tube for those firearms that do not so require buffering. Once installed, the invention provides a mounting structure for a new stock system. In manufacture, the invention is readily molded from any polymer, fiberglass, metal, plastic or any other suitable material. In the case of a module with a buffer tube, a simple metal tube is easily incorporated as a base in the molding process.

WE CLAIM:

1. A buffer tube assembly for a modular gunstock for a firearm comprising:
 - a. An assembly body, having an interior defining a cylindrical and hollow buffer region;
 - b. An interface for which the assembly may be attached to a firearm receiver, the buffer region having an opening through the interface; and
 - c. an outer surface, the surface further comprising:
 - i. a uniform cheek plate, disposed towards an uppermost portion of the buffer tube assembly;
 - ii. two longitudinal grooves, each disposed beneath and on either side of the cheek plate.
2. The buffer tube assembly of claim 1, the body further comprised of a tube, about which the remainder of the assembly body is built, the tube defining the hollow buffer region.
3. The buffer tube assembly of claim 2, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one of each pair diametrically opposed the other on each side.
4. The buffer tube assembly of claim 2, the outer covering further comprising a rail track, defined by uniform transverse grooves and likewise uniform rails located distally on the buffer tube assembly.
5. The buffer tube assembly of claim 4, the rail track having a longitudinal channel transecting the center of the track, forming pairs of half-rails.
6. The buffer tube assembly of claim 5, the at least one edge of each half-rail being angled, oblique in relation to the interface of the buffer tube assembly.
7. The buffer tube assembly of claim 6, wherein the rail most distant from the interface has an angle opposite the remainder of the rails, particularly that the angled edge of the furthestmost half rail is acute towards the interface
8. The buffer tube assembly of claim 2, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.
9. The buffer tube assembly of claim 2, further comprising an end cap, manufactured to threadingly engage the cylindrical tube at an end opposite the end interfacing with the receiver, thereby allowing the an internal length of the buffer region to be adjusted.
10. The buffer tube assembly of claim 9, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one on each side.

11. The buffer tube assembly of claim 9, the outer covering further comprising a rail track, defined by uniform transverse grooves and likewise uniform rails located distally on the buffer tube assembly.
12. The buffer tube assembly of claim 11, the rail track having a longitudinal groove transecting the center of the track, forming pairs of half-rails.
13. The buffer tube assembly of claim 12, the half-rails being angled, oblique in relation to the threaded end of the buffer tube assembly.
14. The buffer tube assembly of claim 13, the half rail furthest from the interface being angled in a direction opposite the remaining half-rails.
15. The buffer tube assembly of claim 9, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.
16. A mounting assembly for a modular gunstock for a firearm comprising:
 - a. an interface for attachment to a firearm receiver;
 - b. a uniform cheek plate, disposed towards an uppermost portion of a buffer tube assembly;
 - c. two longitudinal tracks, each disposed beneath and on either side of the cheek plate.
17. The mounting assembly of claim 16, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one on each side.
18. The mounting assembly of claim 16, the outer covering further comprising a rail track, defined by uniform transverse grooves and likewise uniform rails located distally on the buffer tube assembly.
19. The mounting assembly of claim 18, the rail track having a longitudinal channel transecting the center of the track, forming pairs of half-rails.
20. The mounting assembly of claim 19, the half-rails being angled, oblique in relation to the threaded end of the mounting assembly.
21. The buffer tube assembly of claim 20, the half rail furthest from the interface being angled in a direction opposite the remaining half-rails.
22. The mounting assembly of claim 16, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.
23. A modified buffer tube assembly for a modular gunstock for a firearm comprising:
 - a. An assembly body, having an interior defining a cylindrical and hollow buffer region;

- b. An interface for which the assembly may be attached to a firearm receiver, the buffer region having an opening through the interface; and
 - c. an outer surface, the surface further comprising: i. a uniform cheek plate, disposed towards an uppermost portion of the buffer tube assembly; and ii. a rail track, defined by uniform transverse grooves and likewise uniform rails located distally on the buffer tube assembly.
24. The buffer tube assembly of claim 23, the body further comprised of a tube, about which the remainder of the assembly body is built, the tube defining the hollow buffer region.
25. The buffer tube assembly of claim 24, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one of each pair diametrically opposed the other on each side.
26. The buffer tube assembly of claim 25, the rail track having a longitudinal channel transecting the center of the track, forming pairs of half-rails.
27. The buffer tube assembly of claim 26, the at least one edge of each half-rail being angled, oblique in relation to the interface of the buffer tube assembly.
28. The buffer tube assembly of claim 27, wherein the rail most distant from the interface has an angle opposite the remainder of the rails, particularly that the angled edge of the furthestmost half rail is acute towards the interface.
29. The buffer tube assembly of claim 23, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.
30. The buffer tube assembly of claim 23, further comprising an end cap, manufactured to threadingly engage the cylindrical tube at an end opposite the end interfacing with the receiver, thereby allowing the an internal length of the buffer region to be adjusted.
31. The buffer tube assembly of claim 30, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one on each side.
32. The buffer tube assembly of claim 31, the rail track having a longitudinal groove transecting the center of the track, forming pairs of half-rails.
33. The buffer tube assembly of claim 32, the half-rails being angled, oblique in relation to the threaded end of the buffer tube assembly.
34. The buffer tube assembly of claim 33, the half rail furthest from the interface being angled in a direction opposite the remaining half-rails.

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35. The buffer tube assembly of claim 30, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.
36. A mounting assembly for a modular gunstock for a firearm comprising:
- a. an interface for attachment to a firearm receiver;
 - b. a uniform cheek plate, disposed towards an uppermost portion of a buffer tube assembly
 - c. a rail track, defined by uniform transverse grooves and likewise uniform rails located distally on the buffer tube assembly.
37. The mounting assembly of claim 36, the outer covering further comprising a plurality of pairs of detents, each pair located laterally on the buffer tube assembly, one on each side.
38. The mounting assembly of claim 37, the rail track having a longitudinal channel transecting the center of the track, forming pairs of half-rails.
39. The mounting assembly of claim 38, the half-rails being angled, oblique in relation to the threaded end of the mounting assembly.
40. The buffer tube assembly of claim 39, the half rail furthest from the interface being angled in a direction opposite the remaining half-rails.
41. The mounting assembly of claim 36, the securing means further comprising a clip hole and clip, said clip to interface with the hole and a corresponding hole on a stock attachment.

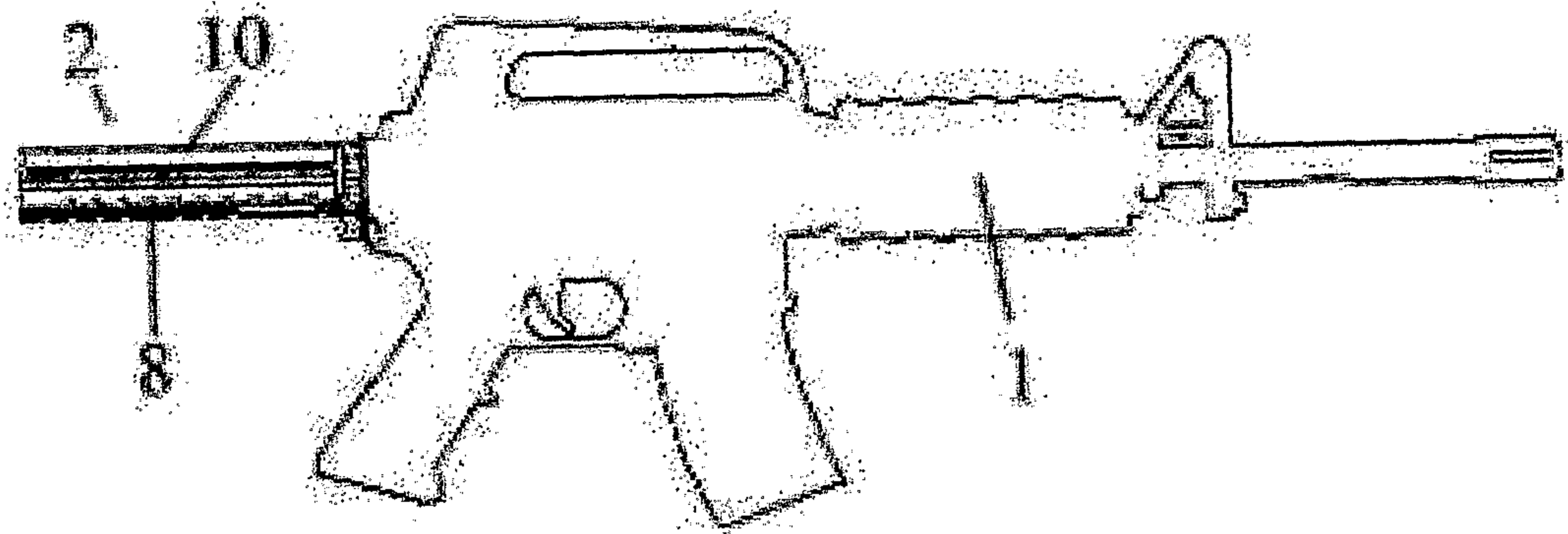


FIG. 1

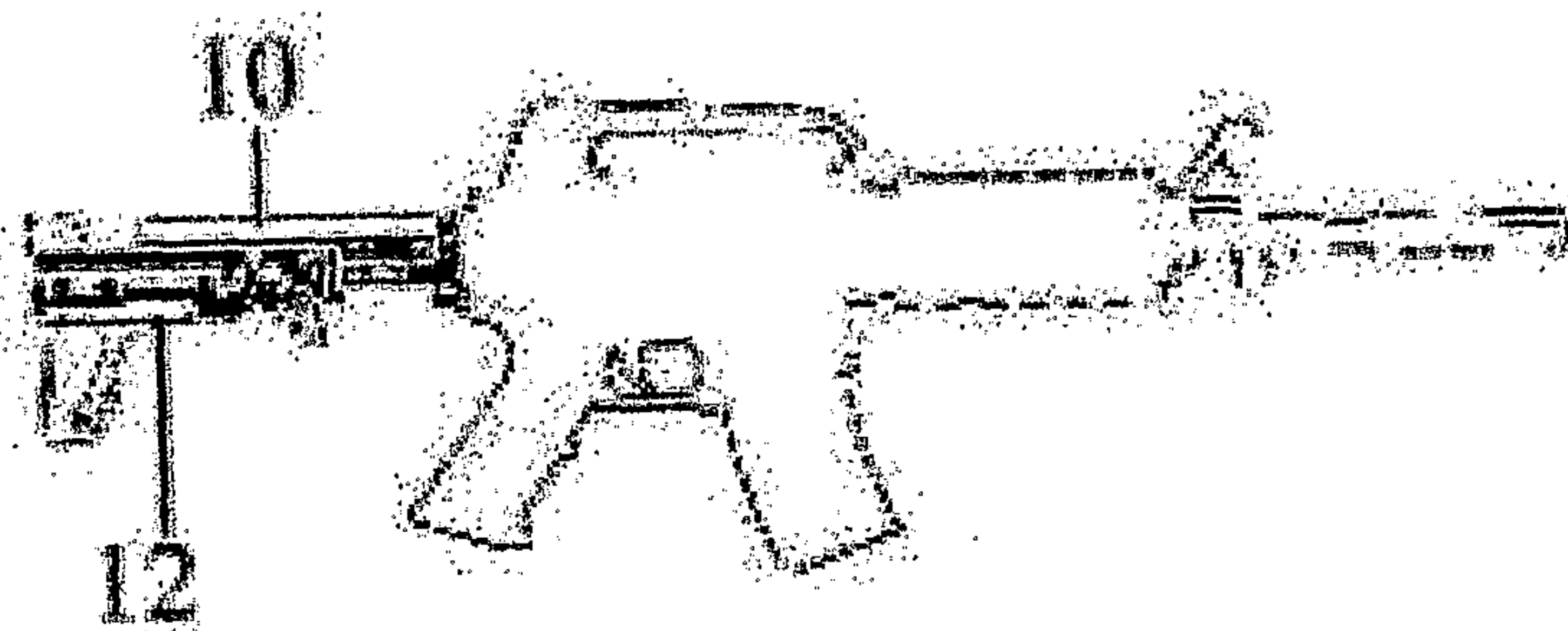


FIG. 1a

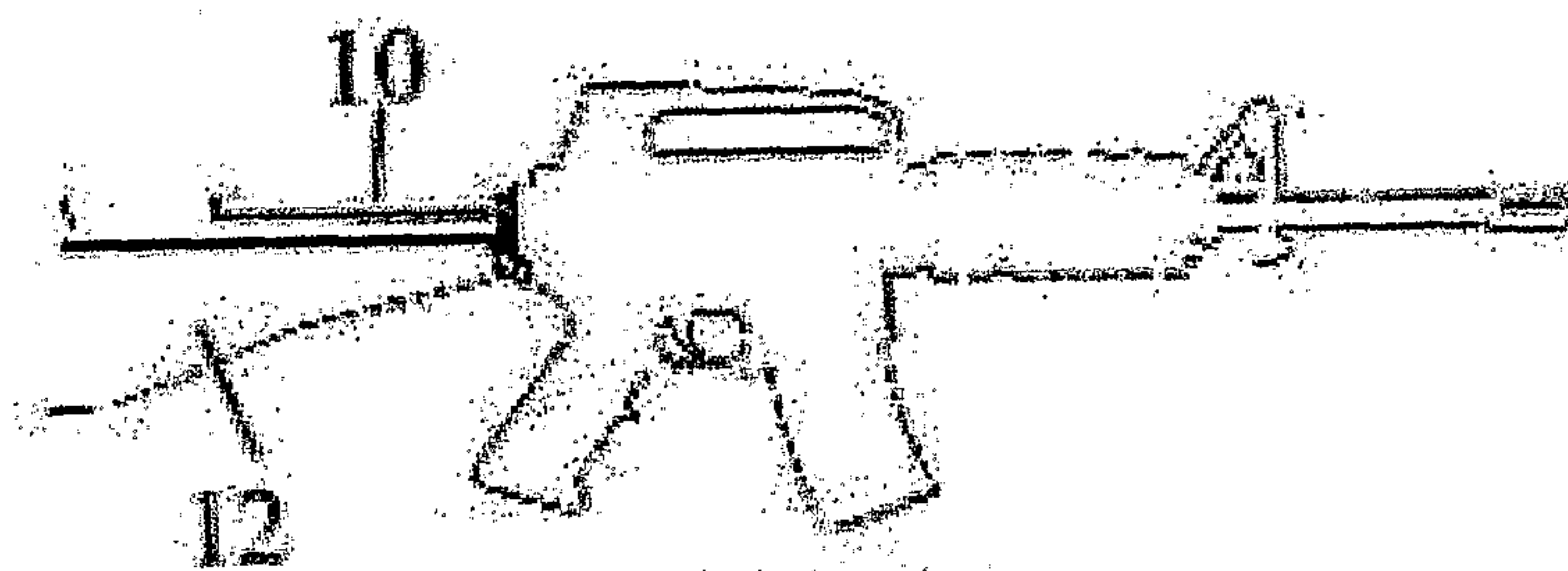


FIG. 1b



FIG. 1c

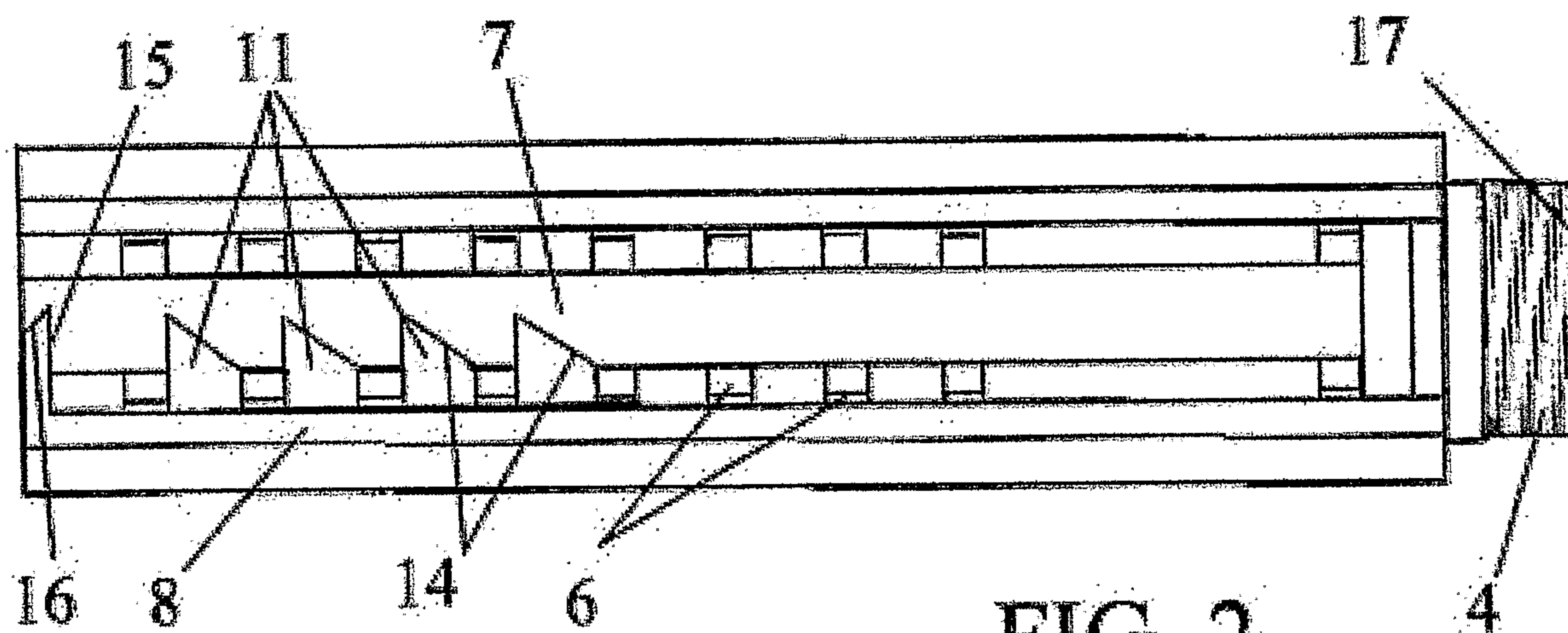


FIG. 2

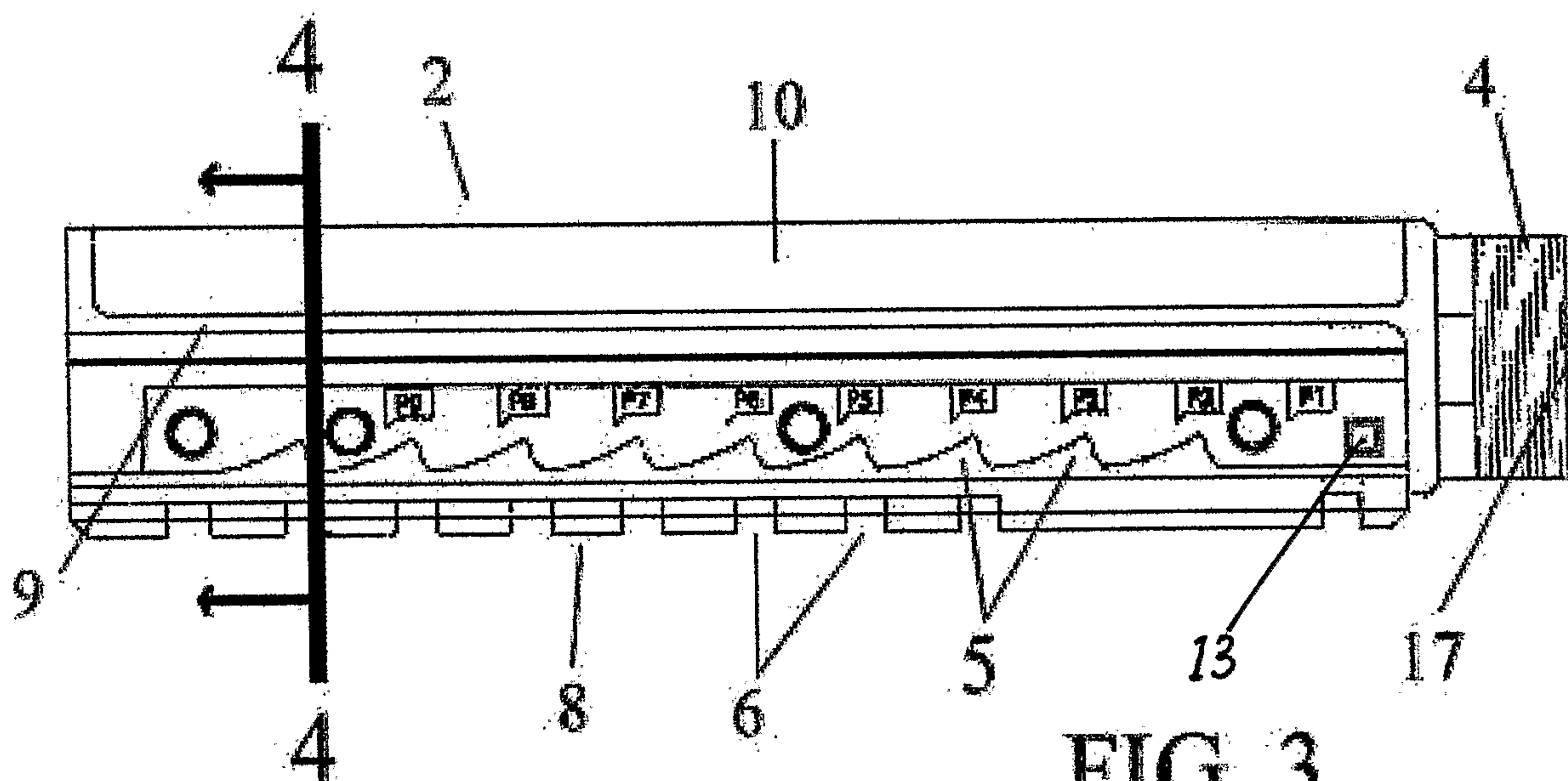


FIG. 3

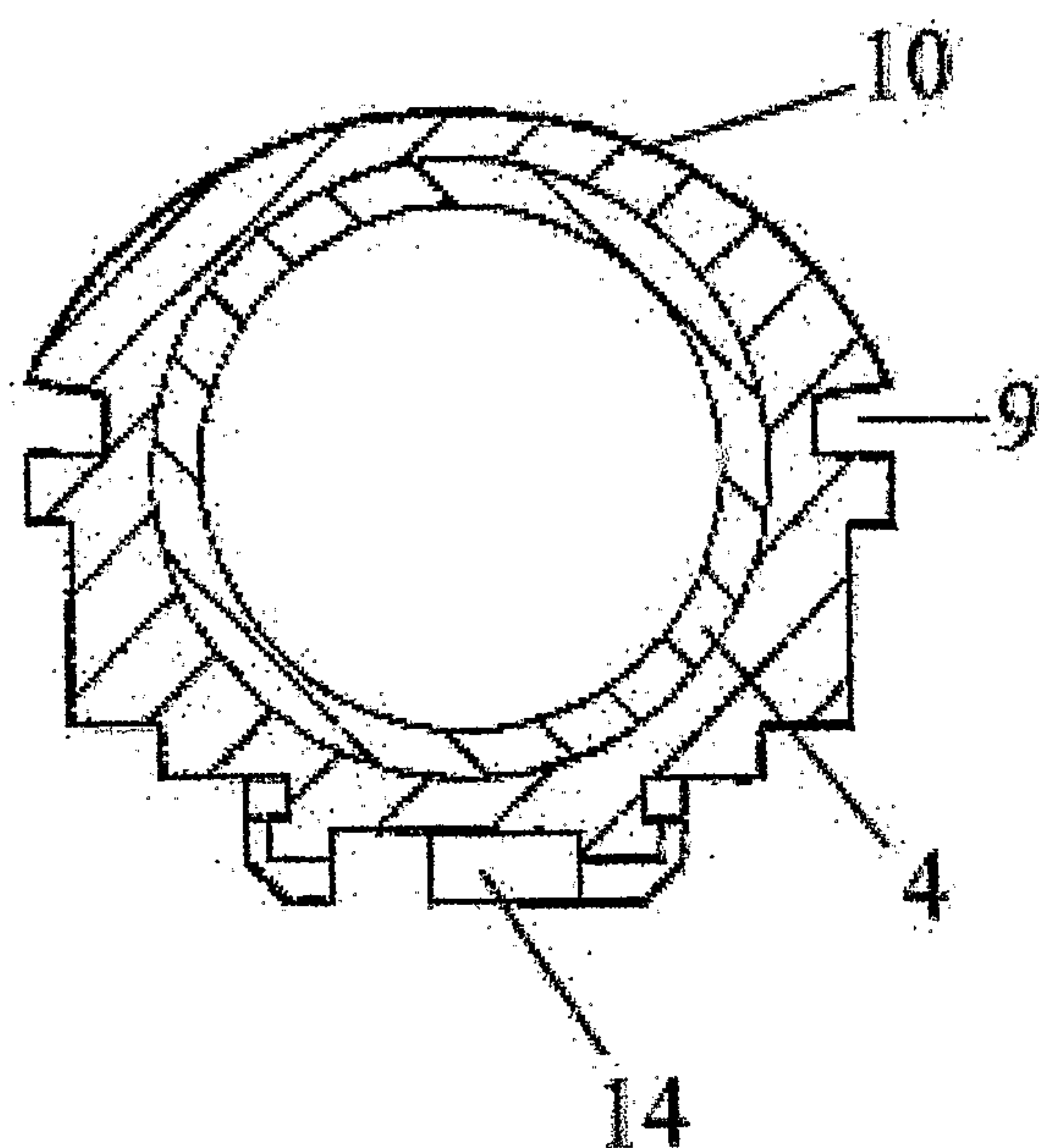


FIG. 4

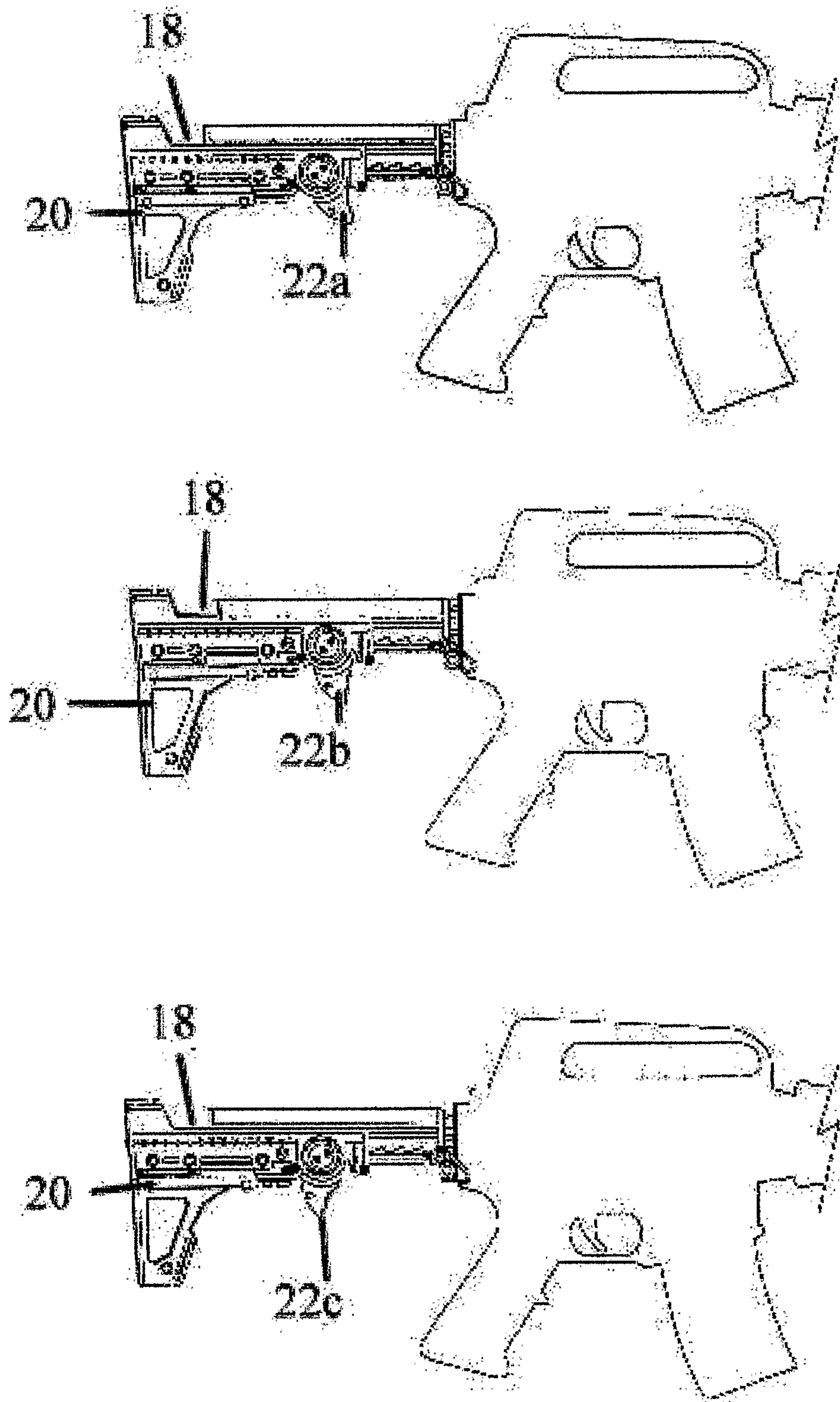


Fig. 5

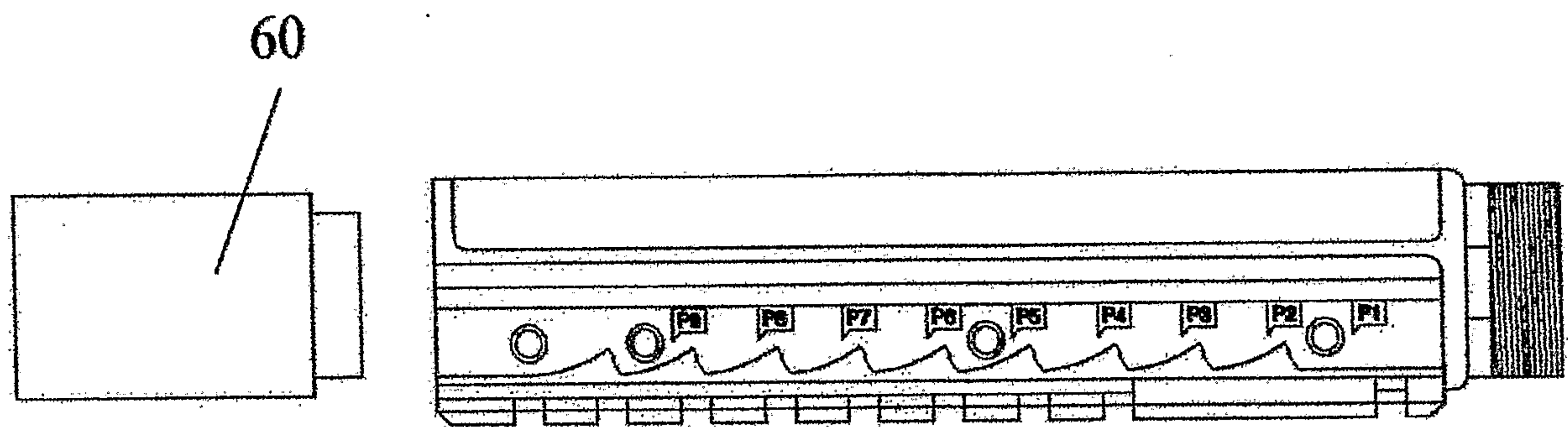


FIG 6a

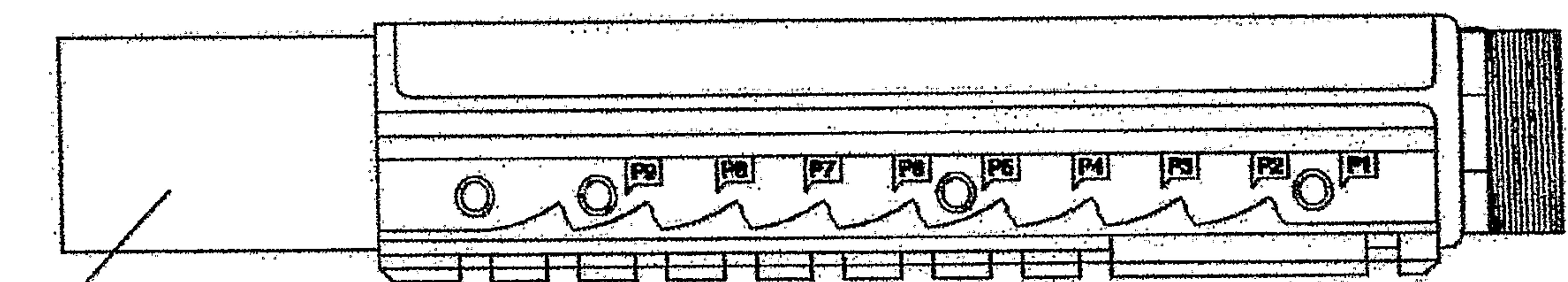


FIG 6b

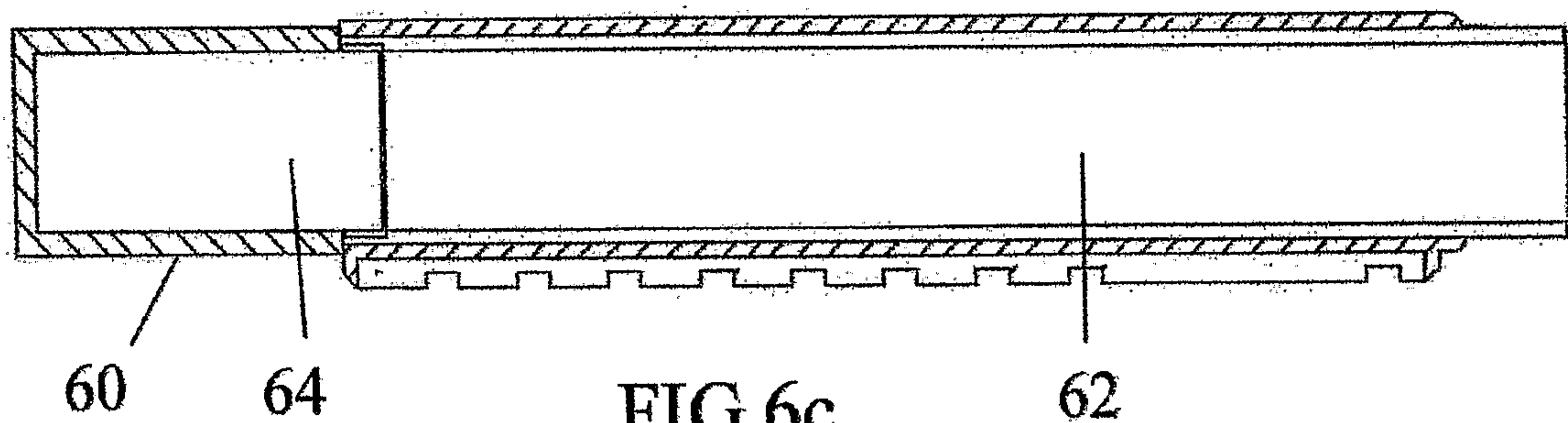


FIG 6c

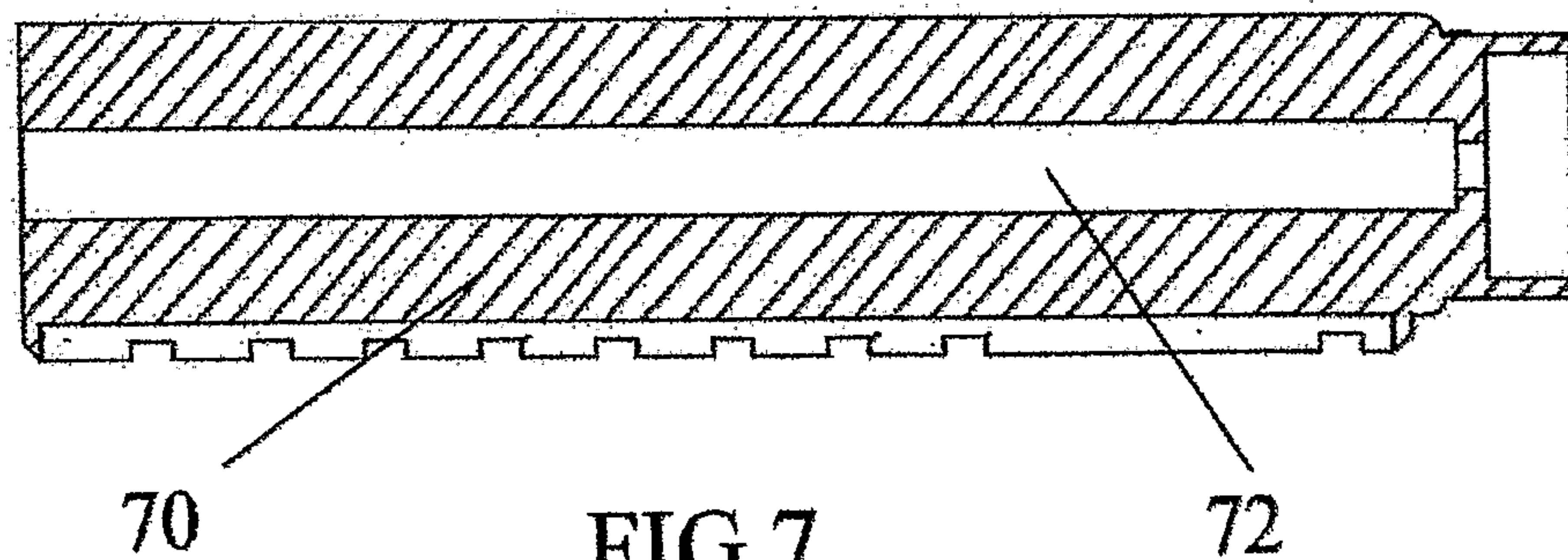
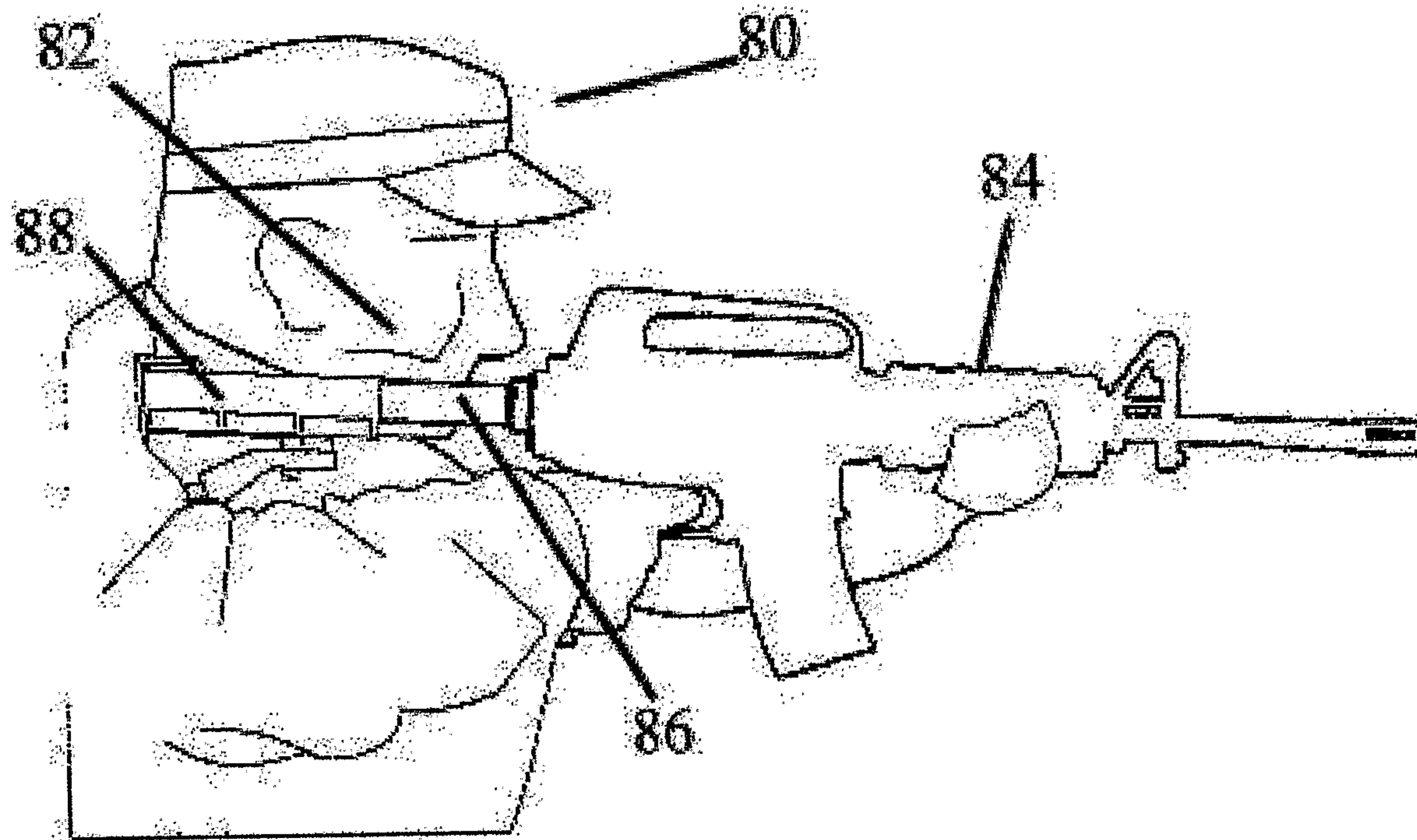
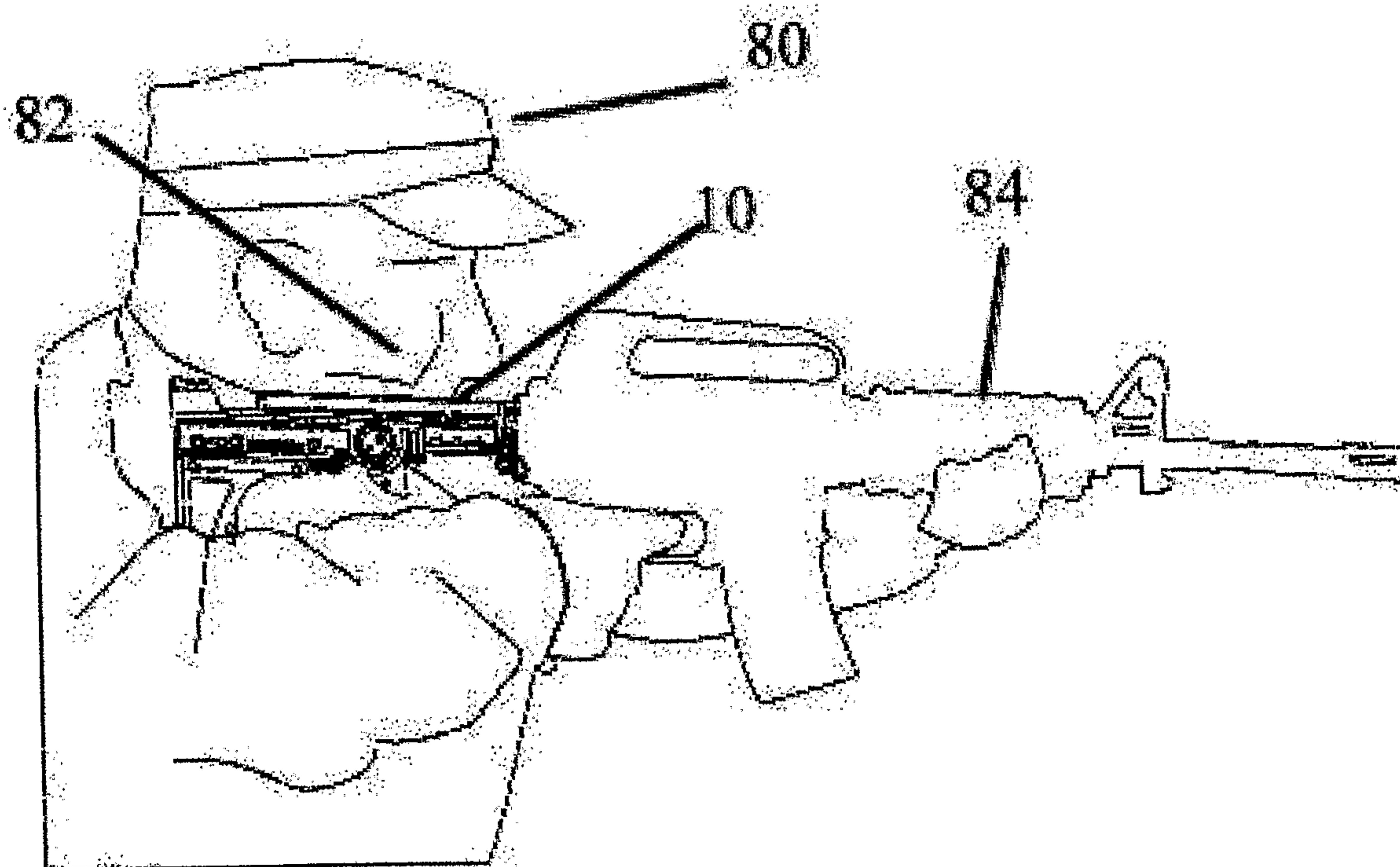


FIG 7

**FIG. 8****FIG. 9**

