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(54) Personal protection firearm.

(57) A firearm for personal protection purposes is provided with is particularly useful in close combat situations. The firearm comprises a support (1) which is preferably in the form of a finger ring which has a barrel (5, 29) defining a chamber (39) and has a trigger operated firing mechanism operable by the thumb of the same hand of a person as that on which it is worn.

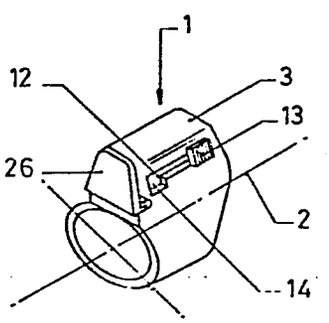

FIG.1

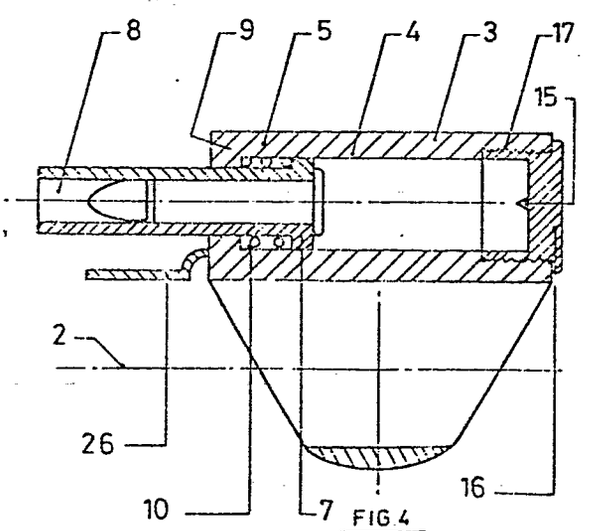

FIG 4

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"PERSONAL PROTECTION FIREARM"

This invention relates to a personal protection firearm of a nature which is easy to transport on a person's body and is also easily made available for use.

Generally employed for the purposes of personal protection are handguns. Drawbacks of the usual handguns are that size and weight make the gun difficult to carry and conceal, or keep in a safe place. Also, where a handgun is used for self-defence, the gun has to be removed from its carrying position, often a holster, and such removal can be difficult for the user to achieve in a stress situation. When a handgun is used for protection, usually one or possibly two rounds are fired. Either the handgun has been removed from the user at such a juncture in time or the attacker has been struck and the gun is no longer required.

In consequence of the difficulties associated with using a handgun, and the delays in removing it from its carrying position, handguns are often removed from a would-be user prior to same being fired. This is particularly so in a close combat situation.

There is thus a need for a firearm which need not be removed from its carrying position prior to its being fired, which can be brought into an operative condition more easily than conventional handguns, which is suitable for close combat situations and which can be sighted and fired swiftly and easily.

In accordance with this invention there is provided a firearm characterised by comprising a support member shaped to be worn on an extremity of a user's arm and assuming the form of a complete or incomplete finger ring for one or more fingers or a wrist band, a breech block carried by the support member and defining the rear end to at least one barrel and associated

firing chamber in the support member, the firing chamber being capable of accommodating a cartridge therein, a firing pin arrangement for firing such a cartridge, and a trigger for activitating said arrangement, the trigger mechanism being located to be operable by part of the same hand as that on which the support member is located in use.

Further features of the invention provide for the support member to be removably fitted to, or to form an integral part of, an endless band adapted to receive one or two fingers therethrough and in each case having an axis extending in the direction of such fingers, in use, and, in particular, for the support member to define a finger ring; for the axis of the barrel to extend in a direction substantially parallel to the axis of the support member; for the support member to have only one barrel, or alternatively, two parallel barrels offset laterally relative to each other; for each barrel to include a cocking mechanism and a flap movable between a position in which it covers the outlet end of a barrel and a position in which it acts as a flash protector to the user in which latter position it

extends roughly parallel to the axis of the barrel; and for the cocking mechanism to be a laterally extending slide movable in the support member to cock the trigger mechanism and movable also in the same plane but in an opposite direction to release the trigger mechanism.

The invention also provides for the or each barrel to be axially movable within a bore in the support member and relative to the breech block against spring loading thereof and for such axially movable barrel to have a laterally (generally radially) extending slide extending through a slot in the support such that the slide serves as a means for cocking and firing the firearm. The barrel is preferably rotatable, at least to a small extent, so that the slide can co-operate with a notch in the slot to hold the barrel in a cocked condition and from which it can be released to fire the firearm.

It will be understood that where the barrel is axially movable in the support it can be supported at both its front and rear ends at the instant of firing as will be appreciated from the following detailed description.

The firing pin mechanism may be adapted for use on rim fired cartridges, in which case it may be located for co-operation with the forward edge of the rim of a cartridge (as opposed to the usual practice of the rear surface of such rim).

Preferably, however, where the barrel is axially movable, the firing pin can be carried by the breech block and may be fixed or replaceable relative to such breech block. The breech block is conveniently a screw-threaded plug removably associated with the support at the rear end of the barrel and is removable to provide access for loading the firearm. Such plug shaped breech block can be shaped so that the skirt thus formed can interfere with movement of the slide described above in a "safe" angular position of breech block but a recess in the skirts edge aligns with the slot in a "firing" position.

The caliber of the chambers or barrels may be of a small bore of the order of 0,22 inches or 5,5mm. The chambers can be adapted to accommodate many different types of ammunition and, apart from standard bullets, hollow point and flat

headed bullets can be used. Further types of lethal and non-lethal ammunition can be employed in the firearm of this invention, these including blank cartridges, flare firing cartridges, cartridges containing shot and also cartridges to propel drug darts, gas and the like. Also small rocket propelled and tracer cartridges could be projected from the firearm. In instances where the cartridges to be fired are non-lethal, the outlet end of the barrel can be choked such that live bullets cannot be properly chambered.

In the case where two chambers are provided selective firing of the catridges therein can be achieved by employing a single trigger mechanism and wherein an initial movement will activate one firing pin mechanism and further movement will subsequently activate the second one.

The barrels could be more in number and could be rotatable about a finger, to provide a revolver type of arrangement. However, such an arrangement will, in all likelihood, become too unwieldly if proper safety, combined with small comfortable size, is to be achieved.

The endless band forming the finger ring or wrist strap may be made rotatable so that the firearm can be concealed against the inside of the user's hand or wrist. Prior to cocking the gun, the ring or wrist strap can once more be rotated so that the barrels are on the outside of the fingers or wrist.

It should be noted that in order to improve accuracy at greater distances of the projected bullet or missile the simple addition of an extension barrel which can be attached to the front end of a barrel or bore housing same is envisaged. Where the chamber is axially movable the extension barrel and the barrel itself could be provided with co-operating inter-engaging fingers to provide for proper alignment of the barrel and barrel extension at the point of firing and for properly guiding a bullet along such extended barrel. Such extension barrel could be rifled if required.

Also a sighting arrangement could be made to simply attach to the ring or other support member.

A silencing or sound moderating device could also be screwed onto the barrels themselves or the extension barrels.

The support body may be interchangeable with a piece of ornamental jewellery on the endless band.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings :-

FIG. 1 illustrates, in isometric view, a finger ring embodying a firearm according to this invention in the closed and inoperative position;

FIG. 2 illustrates, in similar view, the finger ring with the firearm in a cocked condition;

FIG. 3 is a section through the finger ring taken along the axis thereof and in the uncocked condition;

FIG. 4 is a view similar to Fig. 3 but with the finger ring in a cocked condition;

FIG. 5 is a cross-section through the finger ring taken at right angles to the axis thereof;

FIG. 6 is a split sectional view taken along line VI--VI in Fig. 5;

FIG. 7 illustrates in isometric view the spring loaded catch arrangement for holding the firearm in a "safe" or "firing" condition and with the associated flash protector/flap;

FIG. 8 illustrates, in exploded orthographic projection, a second embodiment of the invention; and,

FIG. 9 illustrates in isometric view the association of an extension barrel and an axially movable barrel.

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

Referring firstly to Figs. 1 to 7 the

firearm, in the illustrated embodiment of the invention, assumes the form of a finger ring, generally indicated by the numeral 1, which defines the support of the firearm according to this invention.

The ring has an axis 2 which, in use, is to coincide with the axis of a wearer's finger and has a body portion 3 of the firearm built up on the finger ring and shaped to form a bore 4 having its axis extending parallel to that of the finger ring. An axially movable barrel 5 is located in the bore to define an annular space 6 between its outside surface and the inner surface of the bore and defines a chamber at its operatively inner or rear end. An outwardly directed flange 7 at said inner end is slidable on the surface of the bore. The barrel is guided, at its operatively forward end 8, by an inwardly directed flange formation 9, at the outlet extremity of the bore. Thus, in the firing position in which the barrel is at its innermost position, it is supported at its front and rear ends by the flange 7 and flange formation 9 respectively.

The annular space 6 accommodates a compression spring 10 for operating the firearm

and a radially extending slide member 11 is secured to the barrel towards its flanged end 7. The slide member extends through a slot 12 in the side of the body portion of the support so as to be accessible by the thumb of a person wearing the ring. A suitable friction affording thumb engagement member 13 is provided on the slide.

The slot 12 has an angularly extending recess 14 at its end nearer the outlet from the barrel.

The above arrangement is such that the barrel 5 can be moved forwardly to compress the compression spring and the slide can be rotated somewhat angularly in order to engage it in the recess and hold the slide with the barrel in a cocked position. The gun is to be fired by simply moving the slide angularly with the thumb of the person wearing the ring to enable it to move rearwardly under the action of the spring.

In order to effect firing of the firearm a firing pin 15 is set into a plug-shaped breech block 16 which screw-threadedly engages the end of the bore opposite the outlet end. The breech block is

cup-shaped with the inner diameter of the cup, which is defined by a skirt 17, aligning with that of the bore to form a continuation thereof.

A deep notch 18 in the skirt 17 (see Fig. 7) is, in the firing position of the breech block, adapted to align with the slot through which the slide extends to enable the barrel to move rearwardly sufficiently far for a cartridge in the chamber to engage the firing pin 15 carried in the breech block. The firing pin 15 can be permanently fixed in the breech block or may be removable to provide for replacement thereof.

In other angular positions of the breech block the slide is prevented from moving rearwardly to a sufficient extent that a cartridge in the chamber will contact the firing pin. All such positions correspond to a "safe" position even when the firearm is cocked as the slide will simply engage the end edge of the skirt prior to a cartridge engaging the firing pin.

A click-stop arrangement is provided to define the "safe" and "firing" angular positions of

the breech block and, to this end, a spring-loaded arrangement shown most clearly in Fig. 7 may be provided. Two notches 19 are provided at angularly spaced positions in the free end edge of the skirt with a catch member 20 spring-biased by a spring 21 towards engagement therewith. In one position in which the catch member engages in a notch the deep recess aligns with the slot to define a "firing" position. In the other click-stop position the end region of the slot is obscured by the skirt of the breech block to define the "safe" position. The spring 21 is located in a hole 22 in the body which is parallel to the bore 4 but located offset therefrom and nearer the finger ring axis 2.

In order that the same spring 21 serves a dual purpose, its opposite end bears against a rider 23 in turn engaging a cam formation 24 associated with a hinge 25 of a cover flap 26. The cover flap is hingedly attached to the front end of the firearm and is movable between two positions, one (as illustrated in Fig. 1) in which the end of the barrel and bore are closed by the flap, and a second one in which the flap is pivoted downwardly to extend roughly parallel to the axis of the barrel, and in

which it is located to protect a wearer's finger against flashing produced by the firing of a cartridge. The rider and cam surface are arranged to hold the flap member in either of these two terminal positions just described.

In order to prepare the firearm for use the breech block is unscrewed entirely and a cartridge introduced into the chamber in which it is a light frictional fit. The breech block is replaced and either of the "safe" or "firing" positions can be chosen. Suitable indications are provided on the body of the firearm to show which position corresponds to which condition of the firearm.

In order to operate the firearm the slide is simply moved forwardly against the spring loading of the chamber which automatically opens the flap. The slide is then rotated into the recess in the slot and the firearm is then ready to be fired. The thumb of a person wearing the firearm can simply be employed to release the slide with the friction affording thumb engagement member 13 being flicked upwardly.

It will be understood that, with a finger ring of the above type located on a person's finger, and with the finger bent, the subcutaneous finger tissue expands to provide an extremely tight fit of the ring on a finger and, accordingly, enables the firearm to be aimed fairly accurately, at least sufficiently accurately for reasonably close combat situations. During firing the flap acts as a flash protector against burning by the burnt powder of a cartridge.

Numerous variations may be made to the above described embodiment of the invention. In particular the design of the support and, indeed, the breech block may be varied widely.

Thus, with reference to Fig. 8, there is provided a breech block 27 which slides onto the support 28 laterally and simply locks in position by any suitable catch means or a screw-threaded device.

In the embodiment illustrated in Fig. 8 two longitudinally movable barrels 29 are provided, each of which may be cocked independently of the other but which can be linked to the same firing mechanism so that they could be fired sequentially if required.

Each barrel 29 has a flanged end as described above with a radially extending slide 30 co-operating with one of two parallel slots 31 therefor in the top face 32 of the support. The slides are, in this case, simply in the form of short pins and each slot has a transverse retaining recess 33 at its end remote from the breech block for holding its associated barrel in a cocked condition.

An operating cum trigger member 34 is provided on the support 28 to cover the top face 32 thereof and to be slidable both longitudinally relative to the barrels and transversely to a small extent. The operating member can also serve to retain the breech block in position where the latter slides on laterally from the top surface 32 of the support 28. The operating member has two slots 35 and 36 therein corresponding to the slots 31 in the support but wherein the one 36 is appreciably wider than the other 35. The narrower one 35 has a recess 37 at its end nearer the breech block.

The operating member acts as follows :- with the barrels in the uncocked condition the operating member is slid forwardly to compress both springs 38 for the barrels and to move them to their cocked positions. When the slides are opposite the retaining recesses the operating member is moved laterally to move the slides into their retaining recesses 33 thereby holding them in a cocked condition. The operating member is then slid back to its position in which its slots coincide with those in the support. Conveniently it may be spring biased in both directions to this latter position.

To fire the barrels successively the operating member is pushed laterally with the thumb until the slide 30 associated with the narrower slot 35 in the operating member is released from its retaining recess. That barrel will then fire. Further lateral movement causes the slide associated with the wider slot 36 to be released from its retaining recess and its barrel to fire. This further lateral movement is accommodated by the first slide moving into the recess 37 in the narrower slot 35.

Furthermore, a finger ring device may be made to accommodate two or more fingers of a wearer and, the chamber need not be movable within the firearm but a more conventional type of arrangement could be employed. Also, with rim firing cartridges, the firing pin could even be formed on the rear end of the chamber to co-operate with a rim of a cartridge located therein.

Turning now to Fig. 9 of the drawings there is illustrated a chamber 39 having finger-like longitudinally extending formations 40 on the outer periphery thereof which co-operate with spline-like complementary formations 41 on the inner surface of an extension barrel 42. The extension barrel can, accordingly, be fixed relative to an associated support or body whilst the chamber is axially slidable therein. The co-operating formations thus allow for relative longitudinal movement of the chamber to enable the firearm to operate on the above described principle.

CLAIMS:

1. A firearm characterised by comprising a support member (1, 28) shaped to be worn on an extremity of a user's arm and assuming the form of a complete or incomplete ring (1) for one or more fingers or a wrist band, a breech block (16, 27) carried by the support member and defining the rear end of at least one barrel (5, 29,) and associated firing chamber (39) in the support member, the firing chamber (39) being capable of accommodating a cartridge therein, a firing pin arrangement (15) for firing such a cartridge and a trigger (34) for activating said arrangement, the trigger mechanism being located to be operable by part of the same hand as that on which the support member (1) is located in use.

2. A firearm as claimed in claim 1, in which the support member (1) is removably fitted to an endless band adapted to receive one or two fingers of a wearer therethrough.

3. A firearm as claimed in claim 1, in which the support member (1) is an integral part of an endless band adapted to receive one or two fingers of a wearer therethrough.

4. A firearm as claimed in any one of the preceding claims in which the axis of the barrel (5) extends parallel to the axis (2) of the complete or incomplete ring.

5. A firearm as claimed in any one of the preceding claims, in which a cover flap (26) is provided for covering the outlet end of the barrel (5) in an inoperative condition and is movable to function as a flash protector in the operative position.

6. A firearm as claimed in any one of the preceding claims, in which the barrel (5) is axially slidable in a bore (4) in the support member (1) between a cocked and un uncocked position with the barrel (5) being positioned remote from the breech block (16) in a cocked position.

7. A firearm as claimed in any one of the preceding claims, and wherein a cocking mechanism is provided which includes a laterally extending slide (11) movable in the support member (1) in one direction to cock the firearm and in the opposite direction to fire the firearm and means for holding the mechanism in a cocked condition pending operation of the trigger.

8. A firearm as claimed in claim 7, in which the slide (11) forms, or has fixed thereto, the trigger, and the slide (11) is movable in a slot (12) in the support (1) and through which it extends, and the said means for holding the mechanism in a cocked condition are defined by a transverse recess or notch (14) into which the slide (11) is angularly movable and which is shaped to hold the slide (11) in a cocked condition.

9. A firearm as claimed in any one of the preceding claims, in which the breech block (16) is in the form of a plug engaged in an end of a bore through the support member (1).

10. A firearm as claimed in claim 9, in which the breech block (16) has screw-threads co-operating with complementary screw-threads in the bore of the support member (1).

11. A firearm as claimed in claim 9, or claim 10, in which the breech block (16) is cup-shaped with the inner surface of a skirt (17) defining the cup aligning with that of the bore in the support member (1).

12. A firearm as claimed in claim 11, in which the breech block (16) is rotatable between a "firing" position in which a recess (18) in the skirt (17) aigns with the slot (12) to receive the laterally extending slide (11) and "safe" positions in which the edge of said skirt (17) obscures the path of movement of said slide (11) to prevent firing of the firearm.

13. A firearm as claimed in claim 12, in which a click stop mechanism is provided for selectively retaining the breech block (16) in the "firing" or a "safe" angular position.

14. A firearm as claimed in any one of the preceding claims, including an extension barrel (42) communicating with the barrel

(5, 29) itself.

15. A firearm as claimed in claim 14, in which the barrel (5, 29) is movable axially relative to the extension barrel (42) and cooperating fingerlike or spline formations (41) are provided to define a continuous guide for a bullet.

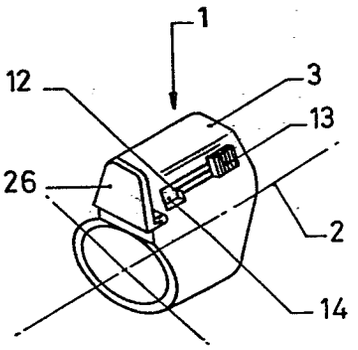

FIG.1

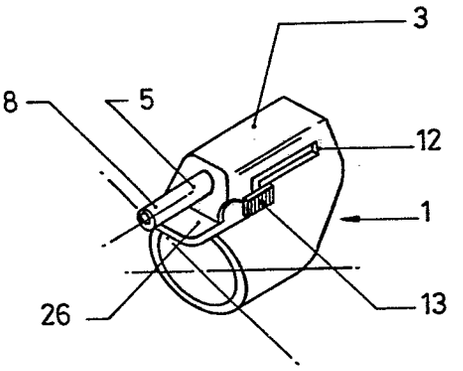

FIG.2

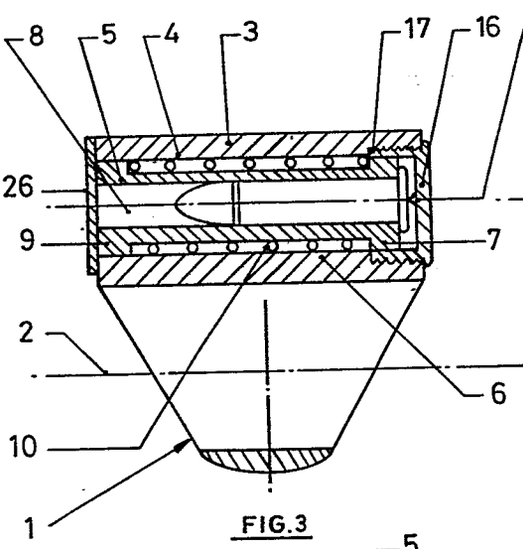

FIG.3

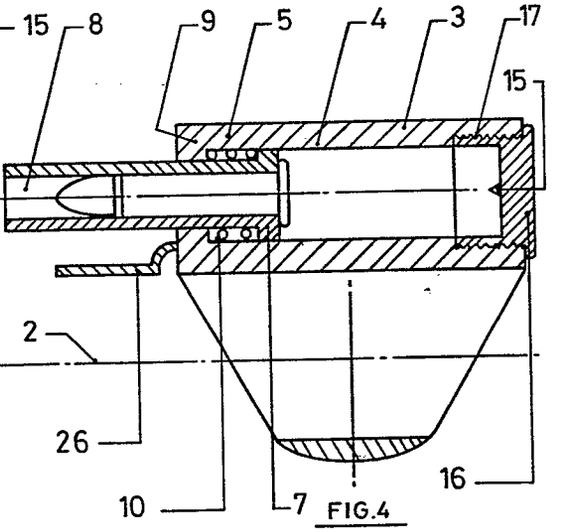

FIG.4

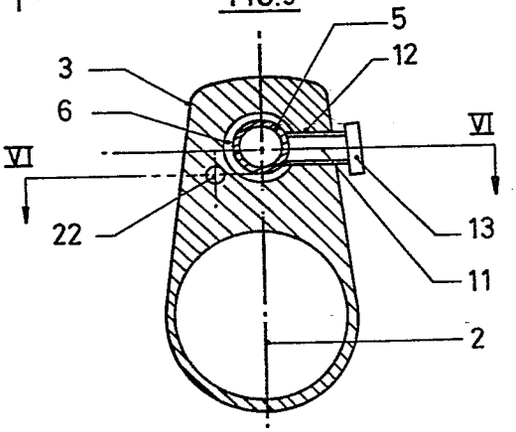

FIG.5

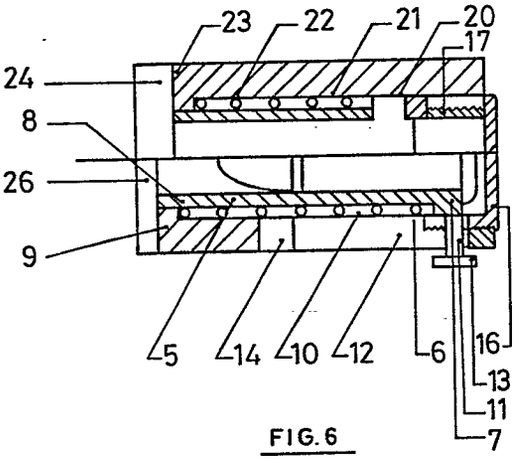

FIG.6

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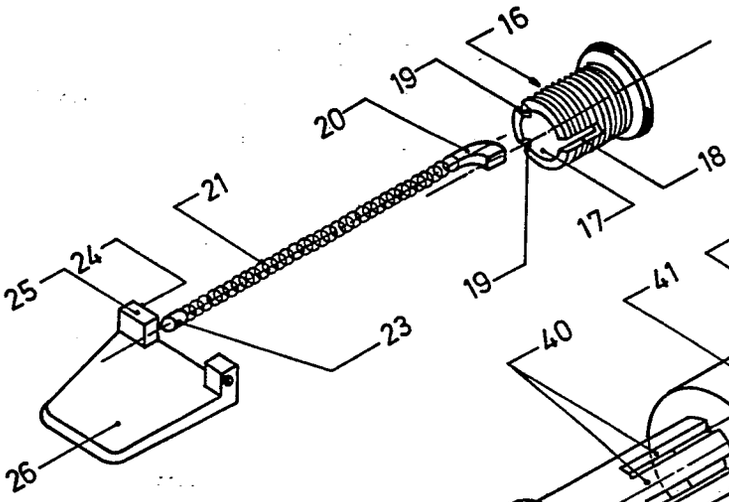


FIG. 7.

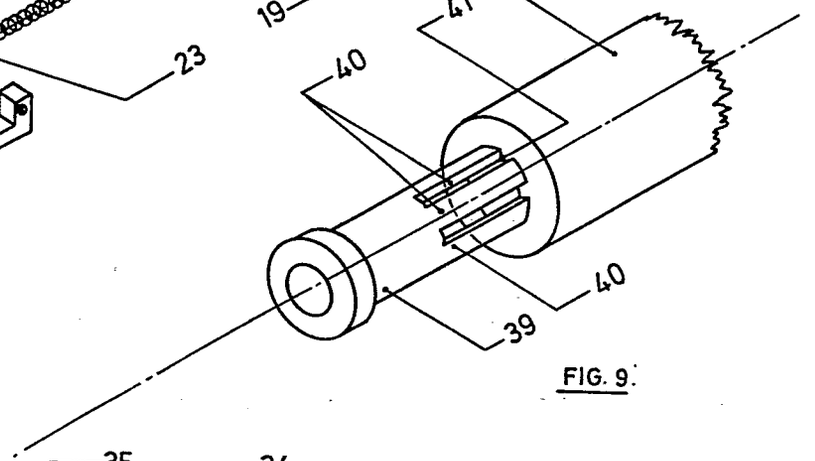
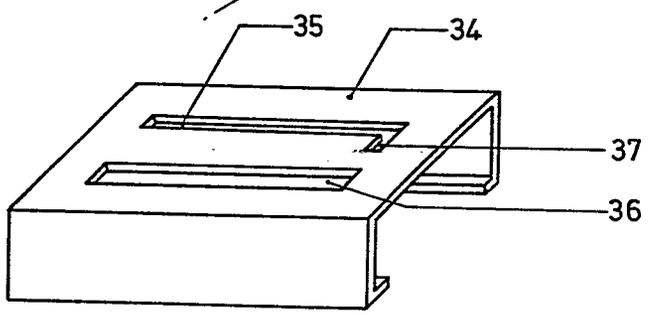


FIG. 9.



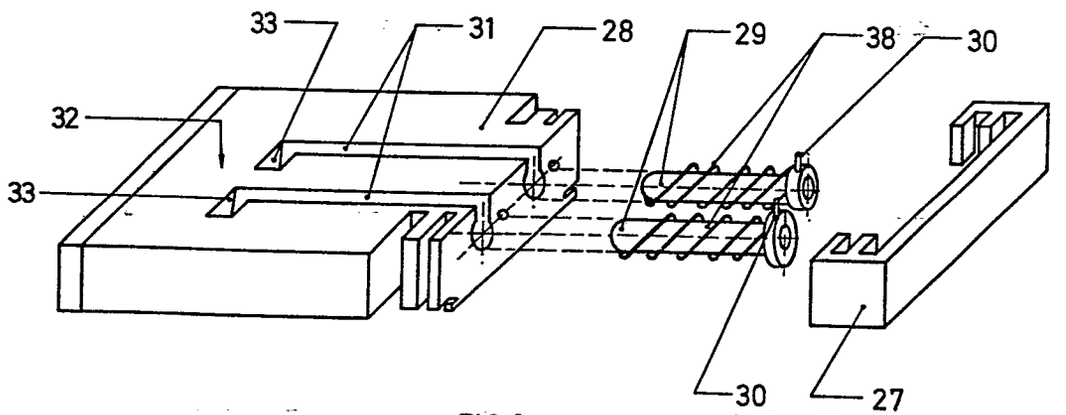


FIG. 8.