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(12) # EUROPEAN PATENT APPLICATION

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(54) **An improved rifle.**

(57) A marksman rifle is disclosed wherein the action-barrel assembly (2,8) is elastically tied to the stock by means of at least one gripping member and comprising two gripping cushions located symmetrically with respect to longitudinal axis of the action-barrel assembly.

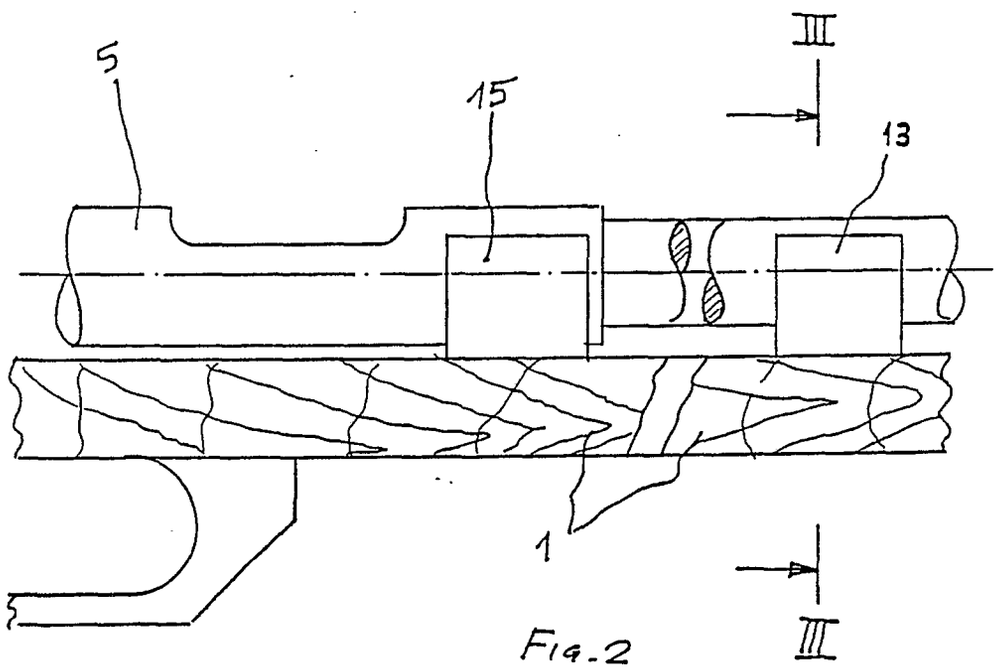


Fig.2

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AN IMPROVED RIFLE

The present invention concerns rifles of the kind in which the bullet is propelled by explosive powder gases, in particular small caliber marksman rifles such as target rifles, snipers' rifles and small-bore match rifles.

Generally speaking a rifle comprises a stock, normally of wood, housing a so-called action which comprises a bolt and firing pin, and also a trigger mechanism. The stock further supports a barrel that is linked to the action forming together an assembly to be referred to hereinafter as action-barrel assembly. The action-barrel assembly comprises a rear sight mounted as a rule on top of the action and a front sight mounted on the barrel near the muzzle thereof. For firing, a round of ammunition is loaded into the breech whereupon the shooter grips the rifle in an adequate fashion, presses the butt against his shoulder and one of the sides of the rear portion of the stock against his cheek, and upon proper aiming squeezes the trigger.

As is well known in the art, firing of a cartridge with an explosive propellant causes a recoil and jump of the rifle which both adversely affect the accuracy of the target shooting. In all prior art rifles of the kind specified the barrel is mounted rigidly on the stock with the aid of pins and bolts and consequently upon firing the entire rifle recoils and jumps. All known efforts to overcome these problems center upon designing the butt portion of the rifle's stock in such a manner as to fit snuggly on the shooter's shoulder and many designs are known in which the butt has a hook-shaped attachment adapted to fit snuggly on the shooter's shoulder and which in some instances is even made adjustable in order to optimize the fit.

There are known sporting air rifles in which, in distinction from the rifles of the kind specified, the bullet is driven by compressed air rather than by the expanding combustion gases of an explosive propellant and in which the action-barrel assembly has an axial degree of freedom in relation to the stock by being tightly gripped by axially extending rigid guide members integral with the stock, e.g. suitably shaped rails, and the assembly is capable of recoiling upon shooting.

Air rifles with recoiling action-barrel assemblies have been known for a long time but so far the recoiling action-barrel assembly concept has not been applied in rifles for shooting explosive ammunition.

It is the object of the present invention to provide an improved marksman rifle in which the adverse effect of recoil on the marksmanship is significantly mitigated.

In accordance with the present invention it has surprisingly been found that the performance of a marksman's rifle is significantly improved by mounting the action-barrel assembly on the stock in a non-rigid, elastic fashion. This finding was surprising since on the basis of prevailing belief and experience it was generally expected that in a rifle for shooting explosive ammunition the barrel-action assembly must be rigidly connected to the stock.

Accordingly, the invention provides a marksman rifle in which the action-barrel assembly is elastically tied to the stock.

The elastic tie between the action-barrel assembly and the stock may be effected by any suitable means such as, for example, an elastic ribbon, springs or tape in combination with the interposition of elastic cushions between the assembly and the stock. Such cushioning may be by means of one single cushion layer extending over a significant portion of the assembly's bottom face, or else by means of a plurality of shorter cushions.

In a preferred embodiment of the invention the elastic tie is effected by means of at least one gripping member integral with the stock and comprising two gripping cushions located symmetrically with respect to the longitudinal axis of the action-barrel assembly.

If desired, it is possible to provide one single elongated gripping member extending over portions of the action and barrel. Alternatively, two or more relatively short gripping members may be provided.

Tests conducted with marksman's rifles according to the invention having a cushioned barrel mounted in the manner specified produced very dense shot grouping, by far superior to anything that can be achieved with conventional marksman rifles for explosive ammunition in which the action-barrel assembly is rigidly connected to the stock.

It has further been found in accordance with the invention that the performance of the marksman rifle of the kind specified can be further improved by shortening the barrel so as not to exceed half the length of a conventional barrel of a rifle of the same kind. Additionally, it is preferred in accordance with the invention that the action-barrel assembly be made as light as functionally possible. If desired in such an embodiment weights may be added near the front end and optionally also at the rear end of the stock in order to increase the inertia and thereby the stability of the rifle.

The beneficial results achieved by shortening of the barrel is due to a combination of several factors. Thus the arcs covered by the muzzle in consequence of a jump and any vibrations due to

the shooter's instability are smaller; the residence time of the bullet in the barrel is shortened; and in consequence of all this the adverse effect of jumps and vibrations on the ballistics are significantly reduced.

If desired, and in order to increase stability, the trigger mechanism is mechanically separated from the action, e.g. by the use of an electrical trigger and other means all known per se.

Also if desired an extension tube bearing the front sight is mounted on the barrel's muzzle having a larger inner diameter than the barrel itself so that it has no influence on the performance of the rifle. By such an arrangement it is possible to combine the advantages arising out of shortening the barrel and the optimization of the distance between the rear and front sights.

For better understanding, the invention will now be described with reference to the annexed drawings in which:

Fig. 1 is a diagrammatic elevation of a marksman's rifle according to the invention;

Fig. 2 is a fragmentary view of the action portion thereof, drawn to a larger scale;

Fig. 3 is a section along line III-III of Fig. 2;

Fig. 4 is an elevation of another embodiment of a rifle according to the invention; and

Fig. 5 is a diagrammatic elevation of yet another embodiment.

The marksman rifle according to the invention shown in Fig. 1 comprises a stock having a fore portion 1 and a rear portion 2 with a hook-shaped attachment 3 fixed to the butt of the latter.

Between the fore and rear stock portions 1 and 2 there is mounted a trigger mechanism 4 of a known kind and above it there is provided an action 5 with the interposition of rubber cushions 6. Mounted on action 5 is a rear sight assembly 7.

The rifle further comprises a barrel 8 having at its muzzle end a front sight 9 and resting on a cushion 10 at the front end of front portion 1 of the stock.

Cushions 6 and 10 form part of the elastic tie between the action-barrel assembly and the stock, which tie may comprise in addition an elastic ribbon, spring or tape (not shown).

A preferred embodiment of the tie between the action-barrel assembly and stock is shown in Figs. 2 and 3. As shown, the upper portion of the fore portion 1 of the stock comprises a groove 12 and a barrel-associated bracket 13 comprising two rubber cushions 14 arranged symmetrically with respect to the longitudinal axis of barrel 8 and gripping the latter. The tie system comprises a second, action-associated bracket 15 of similar design. If desired, a third, similarly designed gripping bracket may be provided near the muzzle of barrel 8.

In the embodiment of the invention shown in Fig. 4 corresponding components are marked with the same numerals as in Fig. 3. In this figure the trigger mechanism and the rear and front sights are not shown for the sake of simplicity of illustration. As can be seen, in this embodiment barrel 16 is short and in this particular case essentially co-extensive with the front part 1 of the stock. The barrel is less than half the length of that in a similar conventional rifle and in consequence reduced.

In the embodiment of the invention shown in Fig. 5, corresponding parts are again designated by the same numerals as in Figs. 1 and 4. In this case the short barrel 16 of Fig. 4 has mounted on its muzzle an extension tube 17 whose inner diameter is larger than the bore of barrel 16 and on whose fore end there is mounted the front sight 9. Due to the fact that the inner diameter of extension tube 17 is larger than the bore of barrel 16, a fired bullet passes through extension tube 17 without touching the walls thereof and consequently the extension tube does essentially not affect on the ballistics and the extent of any jump is determined solely by the length of the barrel 16. At the same time extension tube 17 enables to ensure that the distance between the rear sight 7 and the front sight 9 is optimized.

In order to increase the inertia and thereby the stability of the entire rifle there is provided at the front part 1 of the stock an arm 18 bearing a weight 19, and the hook-shaped attachment 3 is made of a heavy material and is mounted on the butt with the interposition of heavy butt plates 20 and 21.

Claims

1. A marksman rifle wherein the action-barrel assembly is elastically tied to the stock.

2. A marksman rifle according to claim 1 wherein the action-barrel assembly is tied to the stock by means of at least one gripping member (13) and comprising two gripping cushions (14) located cushions located symmetrically with respect to longitudinal axix of the action-barrel assemby.

3. A marksman rifle according to claim 2 comprising one single elongated gripping member.

4. A marksman rifle according to claim 2 comprising at least two relatively short gripping members (13, 15).

5. A markman rifle according to any one of the preceding claims wherein the barrel (16) is shortened so as not to exceed about half the length of a conventional rifle of the same kind.

6. A marksman rifle according to claim 5 comprising a weight (19) connected to the front end of the stock.

7. A marksman rifle according to claim 4 or 5

comprising a weight (3) near the butt.

8. A marksman rifle according to any one of claims 4 to 6 having mounted on the muzzle an extension tube (17) whose inner diameter is larger than the bore of the barrel having a front sight mounted at the front end thereof.

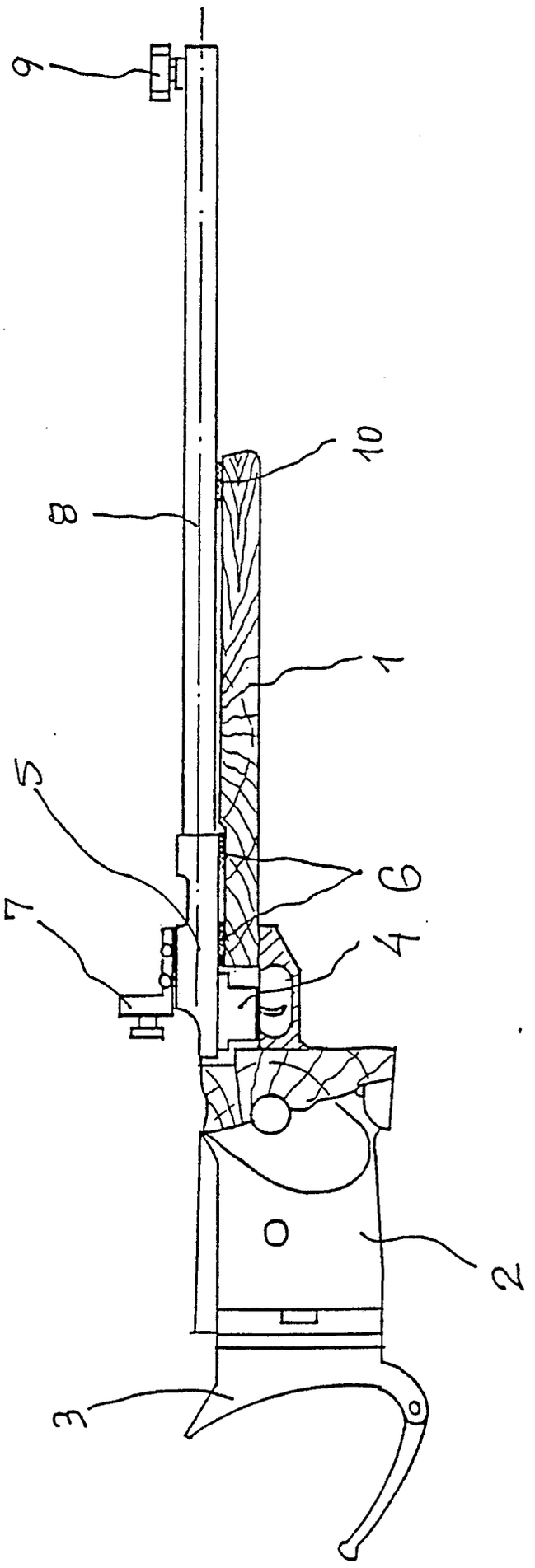


Fig-1

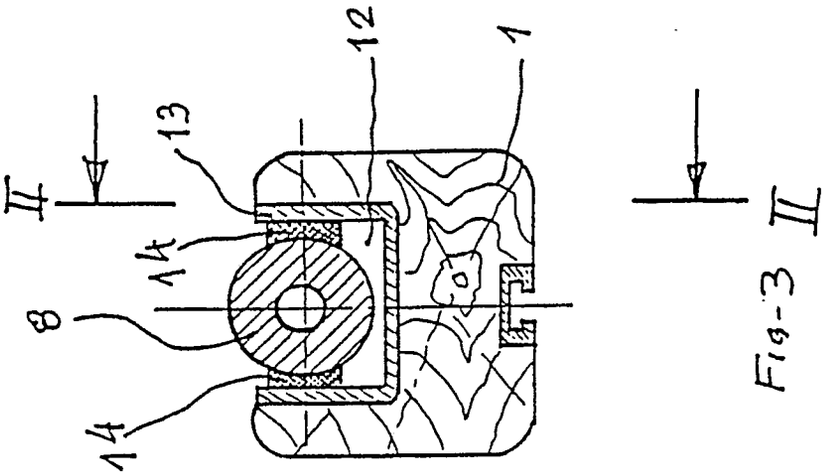


Fig-3

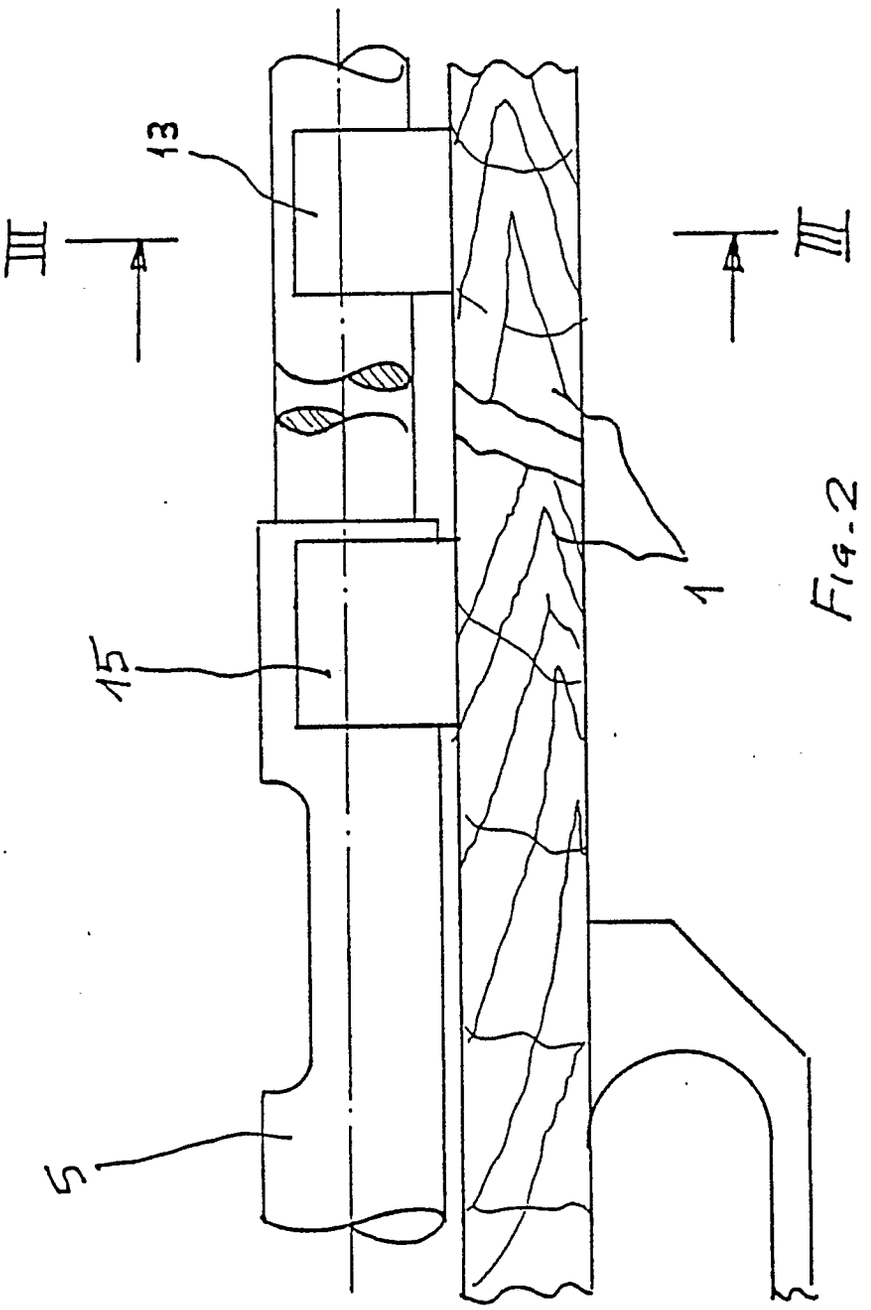


Fig-2

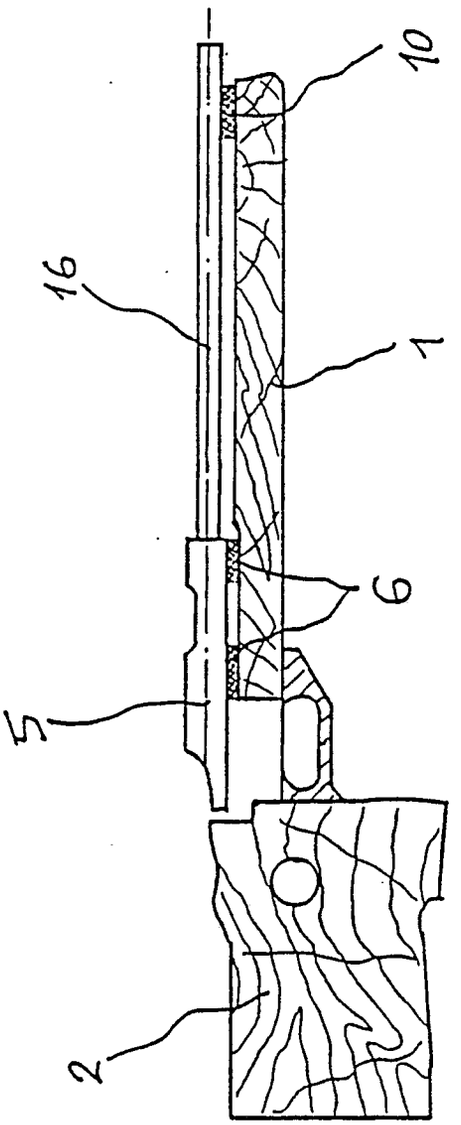


Fig-4

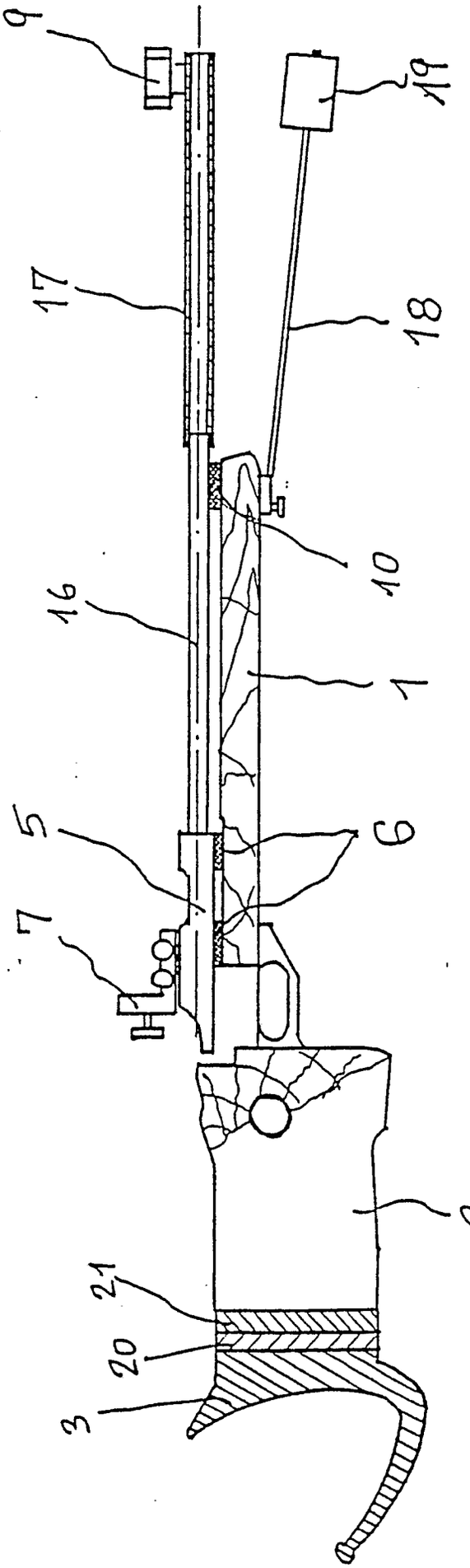


FIG-5