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BREECH CLOSURE

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The invention relates to an automatic firearm comprising a breech which is provided with a supplementary mass. Such supplementary masses are required in order to avoid troubles which are due to rebounding of the breech when running into its shooting position. In all known arrangements the supplementary mass consists of a movable piece mounted on the breech which exerts an impact either directly or over a spring onto the breech to prevent a rebound of it. Since the elastic forces which effect the rebound of the breech as well as the inert forces of the supplementary mass depend on the speed of the breech, a satisfactory operation is guaranteed only for a rather small range of the firing rate. This is a considerable disadvantage of the breeches provided with a supplementary mass.

The object of the invention is to avoid these defects of the known systems. According to the invention this is achieved in that the supplementary mass is formed by a number of individual parts, which are movable relative to one another under friction. Such a construction of the supplementary mass has the advantage that a damping of the movement of the supplementary mass which is high enough to prevent a rebound of the supplementary mass is obtained by the friction of the individual parts of the supplementary mass relative to one another and against the walls of guiding means. By dividing the supplementary mass into many small individual parts the supplementary mass is losing its own elasticity, so that the supplementary mass also for this reason has no tendency to rebound and does not exert a very short and violent impact onto the breech but a lasting and effective thrust. Therefore a firearm according to the invention has a less critical breech speed so that with such an arm ammunition of different kinds can be fired, which can much more be adapted to predetermined requirements than up to now, since it is no more most important to observe a determined fire speed.

A further advantage of the invention is the extremely simple construction and a high reliability. This is especially true when, according to a further feature of the invention, the parts of the mass are loosely filled into one or more chambers of the breech. In a preferred embodiment of the invention the breech is provided with axially directed bores for lodging the parts of the mass and the bores are sealed preferably at their rear ends.

The parts of the mass are thereby formed by granules of a heavy metal, especially of tungsten. The use of granules of a heavy metal according to the invention has the advantage that such a granulated material has a high specific density and that the required supplementary mass can be accommodated in a small space. Further the inner friction of such a granulated material is very high so that an excellent damping is obtained. Beyond that such a granulated material is also mechanically very stable so that an abrasion does not occur.

Further objects, details and advantages of the invention are apparent from the following description in which the invention is explained in detail with reference to the embodiment shown in the drawing.

FIG. 1 shows a longitudinal section through a breech system with the breech running into the shooting position, and

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FIG. 2 shows a breech system according to FIG. 1 with the breech being locked.

The drawing shows a breech system of known construction which has been improved according to the invention. The breech comprises a breech block 1, a control member 2 connected therewith and a breech head 4 which is mounted on the control member 2 of the breech to be displaceable in axial direction. The control member 2 has two control surfaces 3 which cooperate with two interlocking rolls 5a and 5b which are disposed in openings 6a and 6b of the breech head 4 and displaceable transversely to the direction of the movement. When the breech is locked the rolls 5a and 5b enter the recesses 7a and 7b of an interlocking piece 7 in which also the barrel 8 is anchored. When the breech runs forward a cartridge 9 is fed into the barrel 8 (FIG. 2). The cartridge can be fired by means of the striker pin 11, which is displaceably disposed in the breech block 1 and in the control member 2 and is normally kept in a rest position by means of a coil spring 10. For firing the cartridge 9 the striker pin in known manner is knocked upon the bottom of the cartridge by means of a cock (not shown).

According to the invention the breech block 1 of the breech comprises two axial bores 12a and 12b which are filled almost to the half with heavy metal granules 13 serving as supplementary mass, preferably with granules of tungsten. The rear ends of the bores 12a and 12b are sealed by means of screwed plugs 14a and 14b. The remaining hollow spaces 15a and 15b serve as working spaces for the supplementary mass 13.

As known after firing a shot the breech is moved opposite to the direction of fire, whereby it cocks the propelling spring until it is brought to rest by the thrust of the propelling spring or by the impact onto a buffer arrangement (not shown). The supplementary mass 13 according to the invention which is in the front part of the bores 12a and 12b when the breech is locked as shown in FIG. 2 due to its inertia is thrown back when the backward movement of the breech is decelerated and rests against the plugs 14a and 14b as shown in FIG. 1. Due to its inertia the supplementary mass remains in this position also during the forward motion of the breech which is effected by the relaxing propelling spring (not shown). During the forward motion the breech head 4 removes a cartridge from a magazine or a belt in the usual manner and feeds it into the cartridge chamber in the barrel 8 of the arm.

After the breech head 4 has fed the cartridge 9 into the barrel of the arm and has come to rest the interlocking rolls 5a and 5b are pushed into the recesses 7a and 7b by means of the control surface 3 of the following control member 2. This proceeds under the development of considerable forces resulting from the kinetic energy of the control member 2 and the breech block 1, which are both brought to rest. The interlocking piece 7 at first yields to the impact of parts 1 and 2 of the breech exerted over the interlocking rolls 5a and 5b, however it then rebounds and presses the interlocking rolls 5a and 5b against the control surfaces 3 of the control member 2, which in connection with the elasticity of the control member 2 would result in a rebound of breech parts 1 and 2 if no countermeasure were taken. In the moment of rebound the individual parts of the supplementary mass 13 strike the front surface of the bores 12a and 12b, these parts are thrown forward from their position near the plugs 14a and 14b due to their inertia and thus exert a thrust onto the breech which acts against the forces which would cause a rebound of the breech. The impact of the granulated supplementary mass to

the front surfaces of the bores 12a and 12b, however, does not, as in known breeches with a one-piece supplementary mass, take place as an elastic shock, which could again give rise to rebound effects, which, however, should be avoided, but as an essentially inelastic shock, since the supplementary mass consisting of individual parts which are movable relative to one another has a high inner friction by which elastic vibrations of this mass are entirely prevented. The inelastic impact of the supplementary mass effects a lasting and effective counter-thrust which definitely prevents a rebound of the breech and guarantees a perfect interlocking of the breech in a very extensive range of breech speeds.

It is to be understood that the invention is not limited to the embodiment described. The invention is quite independent from the specific construction of the breech and can be applied on principle in all known breeches. Especially the supplementary mass according to the invention may be used not only in a two-part breech as used in the embodiment described, but also in a one-part or mass breech. Further modifications of the specific embodiment described may be devised in that certain of the features characterized by the claims may be used in other embodiments of the invention either individually or in an arbitrary combination. The effect of the divided supplementary mass is not only influenced by the total mass of the individual parts used but considerably also by the relation of their total volume to the volume of the chamber and beyond that also by the shape of the chamber in which the individual parts are assembled.

By the proper selection of these values the time slope and the value of the thrust of the supplementary mass can be adapted to an optimum to the given conditions.

What I claim is:

1. Automatic firearm comprising a breech provided with a supplementary mass, characterized in that said supplementary mass is formed by a number of individual parts in mutual frictional contact, said parts being movable relative to one another.
2. Firearm according to claim 1, characterized in that the parts of the supplementary mass are loosely disposed in one or more chambers of said breech.
3. Firearm according to claim 1, characterized in that said breech is provided with axially directed bores for lodging said parts of said supplementary mass and that said bores are sealed preferably at their rear ends.
4. Firearm according to claim 1, characterized in that the supplementary mass is formed by granules.
5. Firearm according to claim 4, characterized in that said granules consist of a heavy metal, especially of tungsten.

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