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DEVICE FOR SUPPLYING AMMUNITION TO AN AUTOMATIC FIREARM

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2 Sheets-Sheet 1

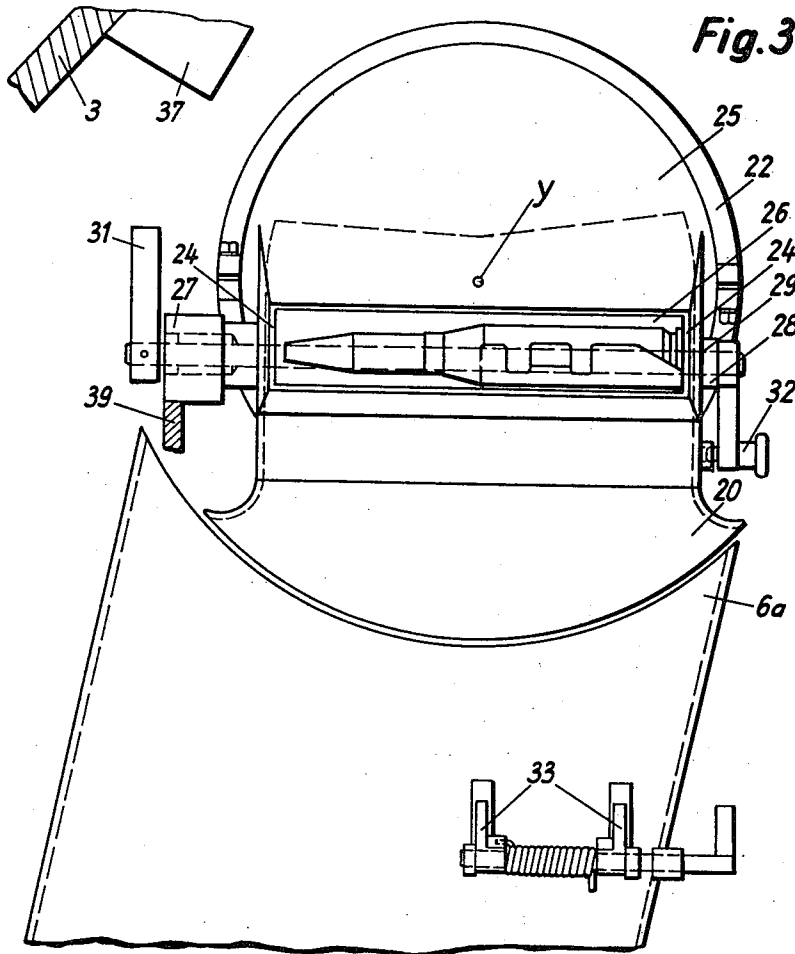
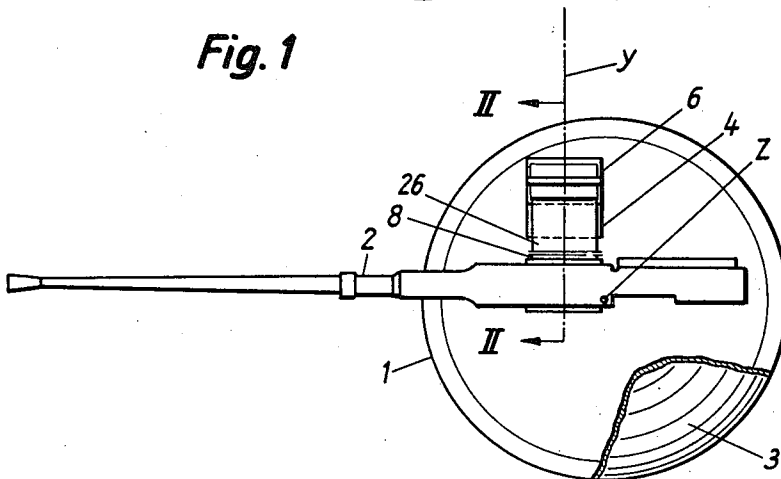


Fig. 1



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DEVICE FOR SUPPLYING AMMUNITION TO AN AUTOMATIC FIREARM

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4 Claims. (Cl. 89—33)

The invention relates to a device for supplying ammunition to an automatic firearm, which device comprises two ducts merging at their outlets into a common duct.

A known device of this kind serves for guiding loose cartridges not joined into a belt. Two star wheels arranged at the juncture of the two ducts control the flow of cartridges in such a manner that alternately a single cartridge from one of the two ducts and from the other passes into the common duct issuing into the ammunition entrance opening of the gun. Such a device is used for example for feeding a gun from two cartridge magazines.

With small calibre guns serving for anti-aircraft defence but having to be used if needs be also against targets on the ground, for example against armoured vehicles, there exists the necessity of firing different ammunition suitable for the target actually to be fired at. With magazine-fed guns there exists the possibility of keeping explosive shells for anti-aircraft defence and armoured projectiles for targets on the ground in readiness in separate magazines, generally drum magazines, and to switch over quickly from one kind of ammunition to the other by putting the corresponding magazine on the gun when there is a change of target. With belt-fed guns one may file an ammunition store consisting of these two kinds of ammunition on the belt mixed at a certain ratio, and supply the same to the gun. This solution has however the inherent disadvantage that part of the ammunition is used up inefficiently, so that it is preferable to file the two sorts of ammunition on two separate belts, and to feed one or the other belt into the gun according to requirements.

The present invention has the primary object of adapting the existing devices to the guiding of separate cartridge belts.

With this and other objects in view which will become apparent later from this specification and the accompanying drawings, I provide a device for guiding ammunition to an automatic firearm, comprising in combination: two ducts merging at their outlets into a common duct, a tongue articulated along the line of intersection of the said two ducts and capable of being adjusted at will into two positions in which it establishes alternately a connection of one of the said two ducts to the said common duct for guiding the ammunition from one of the said ducts into the said common duct.

Preferably I provide a gun mounting, a gun pivotally mounted about a horizontal elevation axis and about a vertical azimuth axis on the said gun mounting, an abutment on the said gun mounting performing only the azimuth laying movement of the said gun, and an abutment piece fixedly connected to the said tongue and co-operating with the said abutment for limiting the elevation laying of said gun.

Owing to this arrangement the belt actually in use is faultlessly guided between its associated duct from which it is supplied, and the entrance opening to the gun, so that it cannot get into oscillations on this stretch which otherwise may involve an abrupt parting thereof, as experience has shown.

These and other features of my said invention will be clearly understood from the following description of a preferred embodiment thereof given by way of example with reference to the accompanying drawings, in which:

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FIG. 1 is a plan view of a gun with ammunition containers, partly broken off;

FIG. 2 is a part-elevation on a larger scale, partly in section on the line II—II of FIG. 1;

FIG. 3 is an elevation of the supply duct as seen from the plane III—III of FIG. 2.

In FIG. 1 the annular race of an upper gun mounting is denoted by 1. On this upper gun mounting, which is rotatable all round about the azimuth axis Z, the gun 2 is mounted in a manner not illustrated in more detail, and moreover an armour hood 3 covering the same is fixedly connected therewith as indicated in FIG. 3. Y is the elevation laying axis of the gun. From the two ammunition containers 4 and 6 connected to the upper gun mounting, cartridge belts 5 or 7 are guided into the entrance opening 8 leading to the belt feeding device of the gun 2.

According to FIG. 2 the belt 5 composed in the usual manner of links 9 articulated to one another and embracing the cartridges 10 is passed upward from the ammunition container 4 through the outlet duct 4a forming a part of a first single duct which is directed with its longitudinal side parallel to the gun 2. To this duct 4a a circular guide track 11 is connected, the axis of rotation of which coincides with the elevation laying axis Y. On this guide track 11 run rollers 13, which are journaled on a circular disc 12 that is rotatable about this axis. On the disc 12 guide sheet metal pieces 14, 15 are fixed, which bound a stretch 16 of the first single duct, the middle portion of which forms a passage 17 machined into the disc 12, a roller 19 journaled on an axle 18 being arranged in an enlargement of this passage and serving for the deflection of this belt. In the basic position of the gun, i.e. at zero elevation, the disc 12 is so positioned, that the roller 19 lies parallel to the longitudinal side of the belt entrance opening 8 of the gun 2. The belt 5 is provided for supplying ammunition to the gun for anti-aircraft defence.

The belt 7 provided for combatting targets on the ground and containing for example hard-core ammunition, is stored in the container 6 having a rectangular outlet duct 6a forming a part of a second single duct. This outlet duct 6a is continued by a stretch 20 of the second single duct. A wall 20a is bent substantially at a right angle to the second single duct and runs towards the lower edge of the inlet opening 8, while the wall 20b is directed towards the guide sheet metal piece 15 of the disc 12 which is attached to the disc. To this wall 20b of the second single duct an annular casing 21 is connected, to which a two-piece ring 22 is clamped that is rotatable in the guide track 11. The wall 23 of a common duct 2b inclined upwardly at an angle from the entrance opening 8 ends in a semi-circular wall 25 placed parallel to the disc and fixed to the casing 21. In the extensions 27, 28 connected to the side walls 24 of this common duct 2b, which converges with the walls 20a and 23, funnel-shape towards the entrance opening 8, a shaft 29 is journaled to which a tongue 30 is fixedly connected which extends over the whole width of this common duct of substantially rectangular shape 26 right to the outlet of said common duct. On one end of this shaft 29 an abutment piece 31 is keyed, and on the other end thereof an actuating lever 32, which can be swung into two positions and secured by detents. In the position illustrated in FIG. 2, this tongue 30, acting as switch points, forms a guide face for the belt 7 coming from the container 6 which extends parallel to the wall 20a up to the entrance opening 8, while in the position indicated in chain-dotted lines it forms in conjunction with the wall 23 a duct leading to the entrance opening 8 for the belt 5 coming from the container 4.

The ducts 20 and 26, respectively, are connected by an intermediate piece 39 fixed to the extension 27 to the cradle

carrying the gun 2, and moves together with the same about the elevation laying axis Y. For this purpose the ends of this movable duct 20 as well as those of the stationary duct 6a of the container are rounded at a radius corresponding to their distance from the axis of rotation Y. The outlet duct 6a is moreover made wider than the duct 20, so that the belt 7 is deflected without effort from the duct 6a into the inclined duct 20, when the gun is elevated.

On the ducts 4a and 6a spring-biased detent pawls 33, 34 are mounted, which in the operative position reach through slots into the interior of the single ducts. The common duct 26 which is connected to the cradle and is rotatable with the same about the elevation laying axis Y drives the disc through a toothed segment 35 fixed to its wall and through a gearing not described in more detail in such a manner that the same performs a rotation about the elevation laying axis Y, which amounts for example to half only of the elevation- or depression-angle of the gun and accordingly of the common duct 26. The abutment 37 fixedly connected to the armour hood 3, in the position of the tongue 30 illustrated in FIG. 2 and accordingly also of the abutment piece 31 shown in dotted lines, serves for limiting the elevation of the gun to for example 30°. This abutment 37 is however no obstacle to the abutment piece 31, which moves upwardly with the weapon and which is turned counter-clockwise with the tongue 30 into the position shown in chain-dotted lines and accordingly permits a laying of the gun not limited in elevation, when the belt 5 is supplied from the container 4.

When firing at armoured targets on the ground, as mentioned hereinabove, ammunition from the container 6 is fired, and the belt 7 is guided to the weapon over the deflector roller 38 arranged in the duct 20, as illustrated in FIG. 2. With this sort of firing the gun need not normally be strongly elevated. By the abutment 37 and the abutment piece 31 the elevation is limited and prevents the laying of the gun to such larger elevation angles, at which the movement of the belt 7 at the juncture between the container duct 6a fixedly connected to the upper gun mounting and the duct 20 elevated together with the gun is so strongly hampered that breakdowns in the belt transport or in the functioning of the gun may occur.

When changing over from targets on the ground to other targets needing ammunition from the container 4 for combatting the same, the belt 7 is left in the container 6 so far, that its foremost cartridge lies at the outlet from the container duct 6a, whereafter it is arrested in this position by the pawl 33. After the readjustment of the tongue 30 to the position indicated in chain-dotted lines (FIG. 2) the belt 5 is pulled into the gun from the position illustrated, and is secured by the pawl 34, in which position the foremost cartridge lies at the entrance to the common duct 26. With the gun elevated, that part of the belt 5, which actually moves in the stretch 16 of the first single duct in the disc 12, is twisted relative to that part of the belt, which is contained in the common duct 2b, by an angle only, which corresponds to a fraction of the elevation- or depression-angle of the gun. The cartridges lying horizontally and parallel to one another in the belt in the outlet channel 4a of the container 4 when ascending to the duct 16 formed by the disc 12 are moreover progressively turned in the plane of the belt defined by the cartridges

up to an inclination corresponding to that of the roller 19.

While I have described herein and illustrated in the accompanying drawings what may be considered a typical and particularly useful embodiment of my said invention, I wish it to be understood that I do not limit myself to the particular details and dimensions described and illustrated; for obvious modifications will occur to a person skilled in the art.

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

1. In combination, a gun, a duct system fixedly connected to said gun for guiding ammunition to said gun, said duct system comprising, a common duct of substantially rectangular shape adjacent to said gun, two single ducts merging at their outlets into said common duct, a tongue articulated within said common duct and between said outlets of said two single ducts and adjustable at will into two positions in which it establishes alternately a connection of one of said two single ducts to said common duct for guiding the ammunition from one of said two single ducts into said common duct.

2. A combination as set forth in claim 1 wherein spring biased detent pawls are mounted on each of said two single ducts reaching in operative position through slots into the interior or said two single ducts for arresting ammunition not to be fed.

3. In combination, a gun mounting, an abutment fixedly connected to said gun mounting, a gun pivotally mounted about a horizontal elevation axis on said gun mounting, a duct system fixedly connected to said gun for guiding ammunition to said gun, said duct system comprising, a common duct of substantially rectangular shape adjacent to said gun, two single ducts merging at their outlets into said common duct, a tongue articulated within said common duct and between said outlets of said two single ducts and adjustable at will into two tongue positions in which it establishes alternately a connection of one of said two single ducts to said common duct for guiding the ammunition from one of said two single ducts into said common duct, an abutment piece having a common pivot axis with said tongue and movable into two abutment piece positions for limiting in one of said two abutment piece positions the elevation laying of said gun by contacting said abutment and for letting pass in the other of said two abutment piece positions said abutment during a higher elevation laying of said gun, a connecting means fixedly connecting said tongue to said abutment piece to coordinate the movements of said tongue and of said abutment piece.

4. A combination as set forth in claim 3 wherein said connecting means comprises a shaft journaled in the side walls of said common duct and carrying said tongue inside said side walls and said abutment piece outside said common duct.

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