

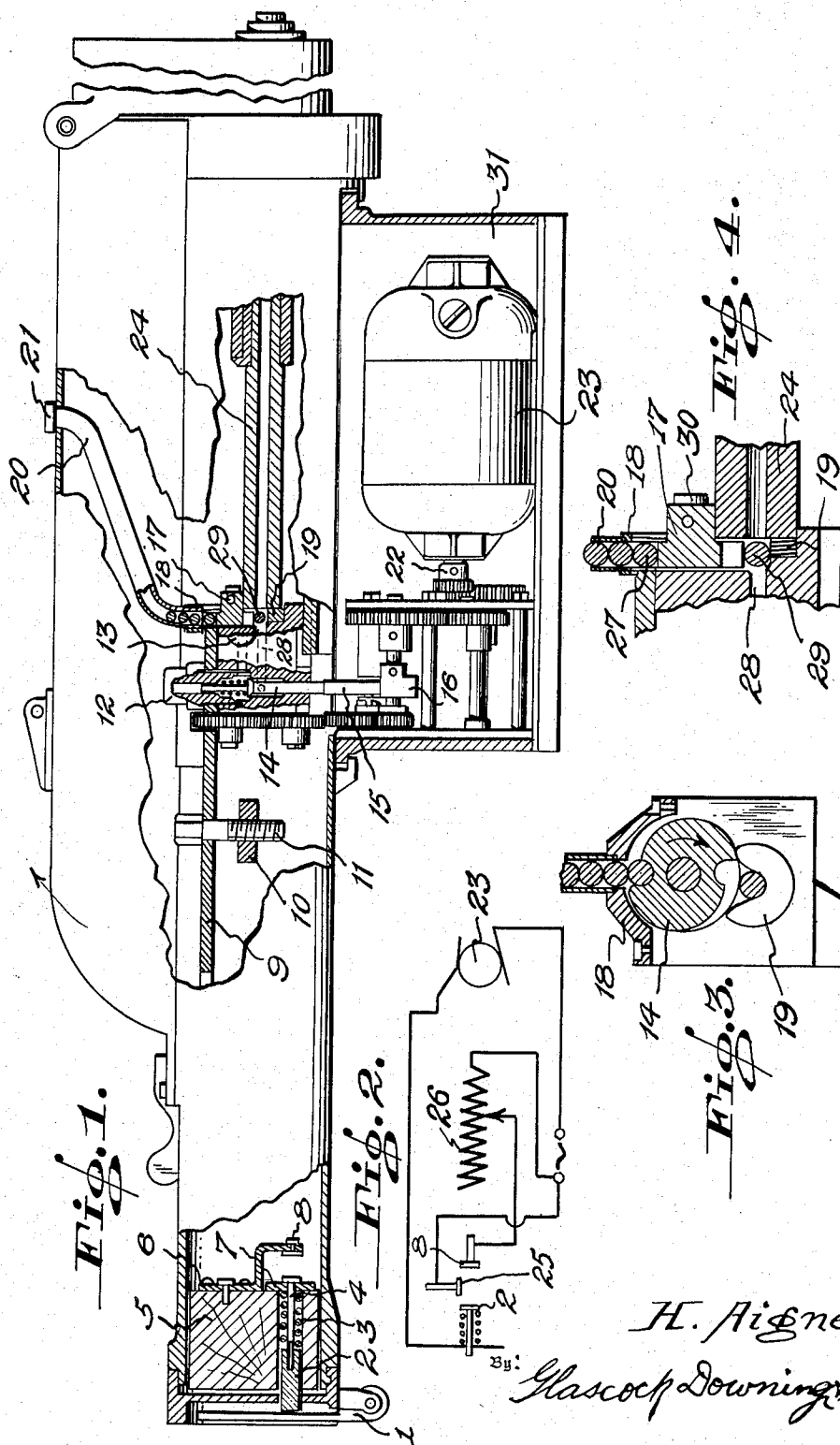
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SLUG SHOOTING ATTACHMENT FOR MACHINE GUNS

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SLUG-SHOOTING ATTACHMENT FOR
MACHINE GUNSHans Aigner, Vienna, Austria, assignor to Eric
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This invention relates to a slug-shooting attachment for machine guns consisting essentially of a slug feed device adapted to be fitted into the casing of the ordinary type of machine gun and of controlling means for a supply of compressed air. Further characteristic features of the invention relate to the particular arrangement and construction of the attachment and its electric drive making it possible, in the first place, for the entire attachment to be rigidly fitted to the usual type of machine gun without any structural alterations to the latter, and in the second place for the machine gun to be handled and fired in precisely the same manner for the slug shooting with the aid of the new device as for normal sharp shooting with live ammunition. Thus, the present invention renders it possible for machine gun practice to be held in small-arms ranges and if necessary indoors, it being merely necessary for this purpose to remove certain parts, to fit the auxiliary attachment, which is done with a few simple operations, and to connect up a hose pipe from a cylinder of compressed air. The handling and operation of the machine gun for firing is not altered or modified in any way. The slug-shooting attachment can be so constructed and adjusted that the rate of firing is the same with the slug-shooting as with normal sharp shooting with live ammunition. In order to avoid the necessity of using large size pellets, a liner of the required reduced bore is inserted in the barrel of the machine gun, and arranged to fit tightly up against the slug feed channel. In order to complete the imitation of normal shooting conditions, the auxiliary attachment according to the invention can also be provided with a suitable jolting device associated with the barrel of the machine gun. This device, which effects a recoil movement of the barrel of the machine gun, can be operated either pneumatically or electrically, and is synchronized with the firing of the slugs.

A form of construction embodying the invention is shown, by way of example, in the accompanying drawing, in which:

Fig. 1 is a longitudinal section of the rear end of a machine gun casing, with the barrel partly broken away, and showing the auxiliary slug-shooting attachment in position for operation.

Fig. 2 is a diagram of connections for the controlling arrangement of an electromotor for the driving of the slug-shooting attachment.

Fig. 3 is a transverse section of the slug feed mechanism.

Fig. 4 is a longitudinal section of the slug feed mechanism.

The slug-shooting attachment according to the present invention comprises five main parts, namely (a) switching mechanism at the rear end of the machine gun, for the control of the electric drive of the attachment, (b) control mechanism for the compressed air supply and for the slug feed, mounted on a common base plate and countersunk in the body of the machine gun, (c) a liner with suitable bore inserted in the barrel, (d) a driving motor with suitable reduction and transmission gearing, assembled in a casing adapted to be fitted in place of the usual cartridge feed mechanism casing on the body of the machine gun, and (e) a supplier of compressed air, which may suitably consist of a compressed air cylinder, provided with a hose pipe for connection to the machine gun. These main parts or elements of the auxiliary attachment according to the present invention will now be described in detail, in the order in which they are named above.

(a) The switching mechanism for the control of the drive of the attachment is associated with and adapted to be operated by the normal trigger lever 1 of the machine gun to which the attachment is fitted. If the drive is by clockwork, the trigger lever 1 is connected by an arrangement of rods to the brake or arresting device of the clockwork mechanism. When the drive is by electromotor, which is the case in the example shown, there is fitted into the rear end of the casing of the gun, after the opening of the cover, a block 5 to which there is attached a conducting segment 7 to which the electric current supply cable is connected. This segment is pierced by a contact pin 4 which, together with an insulating pin 2, is adapted to slide longitudinally in a hole drilled through the block 5 and to be retained normally in the circuit-interrupting position by a helical spring 3. The counter contact is formed of the tongue 6 which is screwed to the block 5, and which is provided with an adjustable contact screw 8 which can be set according to the length of the path of movement of the contact pin 4.

The arrangement of connections employed is shown in Fig. 2 from which it will be seen that there is interposed in the path of movement of the contact pin 4 a further contact tongue 25 which serves to connect the motor 23 immediately to the full current available. As soon as the contacts 4 and 8 come together, but not sooner, there becomes interposed in the current circuit of the motor a series resistance 26 which permits of

the setting of the motor for any desired rate of shooting. The interposition of the short-circuiting segment 25 serves the purpose of enabling the motor 23 to be driven up to full speed within the shortest possible time, and then to be retained at a certain predetermined constant speed for a certain rate of firing.

The sudden violent current impulse thus brought about on starting the motor is disadvantageous from an electro-technical point of view, but can be overlooked in view of the small size of the motor (about 1/30 H. P.). Thus, to start up the motor, the trigger lever 1 is depressed in the usual manner. The thrust pin 2, and with it the contact pin 4 are first caused to slide against the contact tongue 25, with the result that the motor is connected to the full voltage of the current supply and is driven up to full speed in the shortest possible time, after which, on the further movement of the pin 2, the contact pin 4 is brought up against the contact screw 8, whereupon the series resistance 26 is connected into the circuit and serves to retain the motor from then on at the desired constant speed. The whole of the described arrangement of parts, mounted on the block 5, is inserted into the rear end of the machine gun, after the opening of the cover and removal of the usual recoil springs, and secured in position in the manner shown in Fig. 1.

(b) The free space provided by the removal of the recoil springs also serves for the reception of the pellet feed and compressed air valve control mechanism which is inserted into the machine gun casing from above, after opening the top cover (see Figs. 1, 3, and 4). The valve housing consists of a block having drilled compressed air channels which are indicated in dotted lines in Fig. 1. At 13 the channel is provided with internal threading into which the hose pipe connection from the compressed air cylinder is screwed.

The hose pipe is brought in through the aperture in the machine gun casing normally provided for the tilting lever, so that there is no necessity for the provision of a special opening in the machine gun casing for the compressed air feed. The inlet air channel (shown in dotted lines) in the above-mentioned block leads to the valve 14 which is spring-loaded from above by a spring compressed between the valve head and the covering 12. The lower stem of the valve 14 extends almost into the gear casing. Beneath the head of the valve there issues the discharge or shot channel 28 (Fig. 4).

The pellet feed mechanism consists of the feed wheel 17, which is keyed to the shaft 30, and of a driving spur wheel on the same shaft which progressively rotates the feed wheel. Above the feed wheel 17 there is mounted an arched segment 18 into which extends a pellet feed tube 20 through which the projectiles 27 are supplied to the feed wheel 17. The tube 20 is taken through the top aperture normally provided for the lubrication of the machine gun, and, to prevent the escape of compressed air, is provided at the end with a union by means of which it is air-tightly connected to the pellet magazine. Beneath the feed wheel 17 there is provided a fibre packing 19 which positions the projectiles in readiness for shooting, as indicated at 29 (Fig. 4), and which also serves to prevent the escape of compressed air.

(c) A liner 24 of suitable calibre for the pellets (for instance 4-5 millimetres) is inserted into the

barrel of the machine gun, and firmly pressed with its rear end against the packing 19. For the fixation of the block with the valve control mechanism and pellet feed mechanism assembled thereon, there is employed a plate 9 which is tightened and held fast by means of screw bolts 11 in conjunction with the straining segment 10. This type of fastening permits of firm seating and rapid fitting in position of the described mechanism.

(d) The driving motor 23, together with the transmission gearing and the control cam, is housed in a casing 31 which is slidably fitted in place of the normal cartridge feeder casing in the machine gun. The gearing serves for the control both of the compressed air supply and also of the pellet feed.

(e) As a source of compressed air there can be employed either a blower or a compressed air cylinder, connected up to the slug-shooting attachment in the manner described above, by means of a hose pipe.

The mode of operation of the attachment according to the invention is as follows: There are first removed from the machine gun the recoil springs, the lubricator, and the cartridge feeder casing, and the above described four elements fitted in the described positions, after which the compressed air supply pipe is connected up. The auxiliary attachment is then ready for use. Depression of the trigger lever 1 switches on the motor the pinion 22 of which drives the gearing of the control mechanism of the attachment. This gearing also serves to transmit the drive of the motor at reduced speed. The cam 16 pertaining to the gearing is rotated, and periodically presses the segment 15 against the lower end of the valve stem, so that the valve 14 is lifted from its seating and admits compressed air to the discharge chamber 28. At the same time, the other wheels of the gearing effect the rotation of the shaft 30 to which the pellet feed wheel 17 is keyed. The feed wheel rotates in a clockwise direction (see Fig. 3). The projectiles travel down the tube 20, through the arched member 18, on to the feed wheel 17. The feed wheel is provided with two peripheral notches, and is of progressively spirally reduced diameter from one notch to the other in the direction of rotation, so that as the periphery of the feed wheel moves past the end of the feed tube the foremost pellet drops with a steady movement, instead of with a sudden movement, into the next notch. This arrangement prevents the pellets from becoming jammed between the wheel 17 and the arched member 18, and ensures faultless working even at high speeds. The feed wheel throws the pellets one by one onto the leather or like packing 19. After a further quarter of a revolution of the feed wheel, the compressed air valve is opened by the described control mechanism, and compressed air admitted into the discharge chamber, with the result that the pellet positioned at the rear end of the barrel is fired out through the liner 24.

Using a feed wheel having two notches, the described attachment is capable of firing 360 shots a minute. In order to permit of still more rapid firing, it is merely necessary to alter the speed ratio between the compressed air valve and the pellet feed wheel, and to use a feed wheel having three notches instead of the described two.

When electric current is not available, the drive can be by clockwork or any other suitable source of energy. The details of the construction of the attachment can be varied to any ex-

tent, it being merely essential that the attachment be capable of being fitted to a normal machine gun without the necessity for making any constructional alterations to the latter, and that the operation of the machine gun be precisely the same after the fitting of the attachment as before the fitting of the same.

For the purpose of producing the effect of recoil movement of the barrel as in the case of normal shooting with live ammunition, means can be provided in accordance with the invention, for jolting the barrel in synchronization with the slug-shooting. This result can be achieved either by means of compressed air or by the provision of a solenoid associated with the barrel. In the latter case the core of the solenoid is provided with a hammer adapted to hit the barrel, and the solenoid receives current impulses through the intermediary of a contact disc which rotates together with the cam 16. In this manner the imitation of normal shooting is rendered perfect.

I claim:

1. For attachment to an existing machine gun of conventional type, a removable unit comprising packing means adapted to fit tightly against the rear end of the barrel, a pellet feed device associated with the said packing means and adapted to feed a string of pellets one by one continuously into position behind the rear end of the said barrel, an airtight channel leading into the said packing means, a connection for a supply of compressed air, and a motor with control mechanism interposed between the said channel and connection and associated with the said pellet feed device for the periodic admission of compressed air to the said channel at intervals corresponding to the timing of the pellet feed.

2. For attachment to an existing machine gun of conventional type, a liner of reduced bore inserted in the barrel thereof, and a removable unit comprising packing means adapted to fit tightly against the rear end of the said liner, a pellet feed device associated with the said packing means and adapted to feed pellets one by one into position behind the rear end of the said barrel, an airtight channel leading into the said packing means substantially in alignment with the rear orifice of the said liner, a connection for a supply of compressed air, and a motor with control mechanism interposed between the said channel and connection and associated with the said pellet feed device.

3. An attachment as claimed in claim 1 in which the said unit is adapted to be removably inserted in the casing of the machine gun in the position normally occupied by the usual cartridge feed casing.

4. An attachment as claimed in claim 1, in which the said unit mounted on a base plate adapted to be inserted and fixed in position in the casing of the machine gun in the position normally occupied by the usual cartridge feed casing.

5. A slug-shooting attachment for a machine gun of conventional type, as claimed in claim 1, further comprising mechanical driving means both for the said pellet feed device and for controlling the compressed air supply.

6. In a conventional type of machine gun, a slug-shooting attachment as claimed in claim 1, mechanical driving means for the said pellet feed device and control mechanism, and control

means operable by the normal means for firing the machine gun.

7. In a conventional type of machine gun, a slug-shooting attachment as claimed in claim 1, an electromotor, transmission gearing between said motor and said pellet feed device and control mechanism, and a switch for the said motor associated with and operable by the normal means for firing the machine gun.

8. In a conventional type of machine gun, a slug-shooting attachment as claimed in claim 1, an electromotor, transmission gearing between said motor and said pellet feed device and control mechanism, a switch for the said motor associated with and operable by the normal trigger means for firing the machine-gun, and a series resistance in the circuit of the said motor adapted to be switched into circuit after the circuit has first been closed with full current by the said switch.

9. In a slug-shooting attachment for a machine gun of conventional type as claimed in claim 1, the said pellet feed device comprising a feed tube and a disc wheel having peripheral notches closely fitting against the lower end of the said feed tube and against the said packing means.

10. In a slug-shooting attachment for a machine gun of conventional type as claimed in claim 1, the said pellet feed device comprising a feed tube and a disc wheel adapted to be rotated and having peripheral notches for the receipt of the said pellets, the periphery of the said disc wheel being of progressively reduced radius from one notch to the next in the direction of rotation, substantially as and for the purpose specified.

11. In a slug-shooting attachment for a machine gun of conventional type as claimed in claim 1, the said pellet feed device comprising a feed tube passed through the aperture in the casing of the machine gun normally provided for the lubrication thereof, and a rotatable disc wheel having peripheral notches and adapted to fit closely against the lower end of the said feed tube and against the said packing means.

12. An attachment according to claim 1 in which the driving means consist of an electromotor controlled by a switch fitted in the body of the machine gun, and which is so arranged that the slug-shooting attachment is actuated by the same manual operations as those employed for the normal shooting of live ammunition from the machine gun.

13. An attachment according to claim 1 in which the driving means consists of an electric motor provided with a starting switch which, during the switching operation, first switches the full voltage of the available current supply, and then, for constant working, a regulable series resistance, into the current circuit of the motor.

14. An attachment according to claim 1 in which the pellet feed device is provided with notches as its periphery, and that the diameter of this device decreases progressively from one notch to the next in the direction of rotation, so that the lowermost pellet in the feed tube can drop with a steady movement into the next notch in the feed wheel during the rotation of the latter.

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