The Beardmore-Farquhar Machine Guns
MODELS OF 1924.

Note: The earlier model was the 1919.
The later model (about 1936) is described in a supplement.

WILLIAM BEARDMORE & COMPANY LIMITED,
PARKHEAD STEEL WORKS, GLASGOW,
and
36, VICTORIA STREET, WESTMINSTER,
LONDON.
The Beardmore-Farquhar Machine Guns.

MODELS OF 1924.

British Patents, No. 9118/10, No. 127957 and No. 183325, and other patents.

SPECIAL FEATURES.

It is the lightest Machine Gun.

It is the cheapest to manufacture.

It is the cheapest to use. Owing to the Spring system there is less strain on the working parts, and therefore, fewer breakages and fewer spares are required, than with any other Machine Gun.

It cannot jamb. If any sort of failure occurs, due to defective ammunition or other cause, it can be cleared without dismounting any part of the gun.

It has perfect breech locking, and cannot be fired until the breech is locked.

It is well protected against the entrance of dust and mud.

It can be used without any oil, and is, therefore, not liable to go out of action through freezing at very low temperatures or high altitudes.

The Automatic Mechanism is never lubricated. It is not affected by the heat of the barrel, and will continue to function even though the barrel be kept red hot by continuous rapid firing.

AUTOMATIC MECHANISM AND BREECH ACTION

The self-loading mechanism is gas operated.

The power obtained by the explosion of the charge does not act directly on the breech mechanism, but is stored up until the pressure has gone out of the barrel, when the breech may be opened with safety and without unnecessary force.

The power is stored in the main spring, which is compressed by a piston which acts towards the breech and is controlled by a catch.

The piston is in a cylinder which is attached to the barrel and connected with the bore by an aperture.

The main spring is contained in the front end of the spring-tube.
The main-spring catch is attached to the spring-tube.

At the front end of the main spring is a washer made to engage the catch, and the front of the washer is against the rear of the piston. The rear end of the main spring is against the head of the inner tube.

The inner tube lies inside the main spring, and its head is connected to the bolt carrier by the connecting arm.

The bolt-closing spring is on the central rod, which is seated, with the rear end of the spring tube, in the crosshead underneath the barrel.

The central rod passes through the inner tube, and the bolt-closing spring presses against the front end of the inner tube.

The front end of the spring-tube is held in position by the tube cap and fore-end cap.

When a cartridge is fired, gas passes through the aperture in the barrel into the cylinder and forces the piston rearwards, compressing the main spring and putting the catch into engagement with the washer. The main spring is thus compressed between the catch and the head of the inner tube and remains so until the resistance to turning the bolt, caused by the pressure of gas in the chamber and of the locking lugs against the body, is so reduced that it can be overcome by the strength of the spring. Then the compressed main spring, having a firm abutment against the washer, extends rearwards, carrying with it the inner tube to which the bolt carrier is attached, opening the breech, ejecting the empty cartridge case, and compressing the bolt-closing spring. The main spring now being extended, no longer presses against the catch which disengages from the washer, and the compressed bolt-closing spring closes the breech, bringing a fresh cartridge from the magazine into the chamber, and returns the inner tube, main spring, washer and piston to the firing position.

The BREECH ACTION is a "straight pull," having a bolt carrier sliding in slots outside the body.

The bolt carrier is provided with an internal cam slot which engages the bolt arm.

The bolt is made up of a non-rotating cocking-piece and a rotating bolt-head. The locking lugs are at the front of the rotating bolt-head and engage with corresponding resisting shoulders situated in the body immediately behind the chamber of the barrel.

The bolt-head is provided with a bolt arm which is an extension of one of the locking lugs and engages with the cam slot in the bolt carrier. When the bolt arm reaches the end of its slot in the body, the bolt carrier continues its forward movement, and the bolt arm is turned by the cam slot until the locking lugs engage the resisting shoulders, and the bolt is thus securely locked to the body.
METHOD OF CARRYING BEARDMORE-FARQUHAR LIGHT MACHINE GUN AND EQUIPMENT CONTAINING 4 MAGAZINES (324 CARTRIDGES)
The extractor is of the Mauser type.

The ejecting mechanism consists of an ejector pin, supported by the ejector spring, and is contained in the bolt head, the point of the ejector pin protruding through the face of the bolt. When the bolt is closed over a cartridge the pin is repressed level with the face of the bolt, but when the cartridge has been extracted so far that it is no longer supported by the body, the ejector pin jumps smartly forward, throwing the cartridge to the side.

The force with which the breech is opened is always the same, as it is effected entirely by the main spring compressed each time to the same extent.

The striker cannot explode the cap until the bolt is locked.

The bolt remains locked until the force required to unlock it is less than the strength of the compressed main spring; and no amount of extra gas pressure can cause the bolt to unlock until it is safe to do so, or affect it in any way.

The strength of the compressed main spring is less than that of the extractor or of the cartridge rim, so that separated cases, broken extractors, and torn cartridge rims do not occur through the action of the automatic mechanism.

Firing may be performed either one shot only for each pressure of the trigger, or automatically (up to the capacity of the magazine), so long as the trigger is kept compressed. The change is effected by the tripper which either permits or prevents the disengagement of the drawbar with the sear.

The "Beardmore-Farquhar" is a one-man machine gun, just as a rifle is a one-man weapon. The magazines, magazine catch, and other controls are designed and arranged for the convenience of the firer and not of an assistant whose position, as in practice with other light machine guns, is dangerously conspicuous.

The business of an assistant, if one were to be allotted to the gun, should be merely to carry ammunition, to place magazines in convenient proximity to the firer, to assist in re-charging magazines when opportunity occurs, and to take over the gun in the event of the firer becoming a casualty.

No assistance is required by the firer in the handling of the gun or magazines.

The gun can be made of any desired calibre, and for any make of cartridge.

Synchronising gear has been successfully applied to the gun, which can therefore be employed as a pilot's gun in aircraft, to fire through the propeller.
A higher rate of firing can be obtained, and maintained without strain or damage to the mechanism, extractor, or cartridge cases, with the Beardmore-Farquhar than with any other machine gun. It is therefore especially suitable for use in or against aircraft, tanks, boats, and wherever a machine gun is employed on a fixed mounting, or against a rapidly-moving target where a very high rate of fire is required.

**Light Guns, Mark II.**

·303 in., 7.65 m/m., 7 m/m, etc.

**GENERAL DESCRIPTION.**

Weight of Gun complete with mounting ... 15½ lbs.
Length of Gun ... ... ... 47¾ inches
Length of Barrel ... ... ... 26 inches
Weight of Barrel without attachments ... 3½ lbs.

The cartridges are fed into the body of the gun by a spring-actuated magazine.

On the front end of the body is the CROSSHEAD, of which a downward extension provides a seating for the spring tube and also for the front end of the trigger guard and rear end of the tube protector. It has a stud on the top which positions the rotary magazine, and recesses at the sides for purposes of attaching a fixed mounting, if required for use in Aircraft, Tanks, etc., and has a stud on to which the strap, which holds up the bipod legs, fastens.

The BODY-CAP is attached to the rear end of the body by means of an interrupted screw. It provides a socket for the stockbutt, which is attached to it by a screw bolt, and it contains the buffer spring which checks the rearward travel of the bolt.

The TRIGGER GUARD is seated at its rear end in the underneath of the body-cap, to which it is attached by the trigger guard retaining bolt, and at its front end in the crosshead underneath the spring-tube seating, where it is fastened by the crosshead screw.

The HAMMER and HAMMER SPRING are contained in an upward extension of the body, and the hammer is controlled by the Automatic Sear which is operated by the bolt carrier.

The TRIGGER work is contained in the trigger guard. The trigger operates the drawbar which engages with and operates the sear.
BEARDMORE-FARQUHAR LIGHT MACHINE GUN.
WITH CHARGER LOADING MAGAZINE AND WOOD FOREND IN PLACE OF BIPOD
The DRAWBAR contains the tripper which, by means of an extension, can be placed so as to be engaged, or not to be engaged, by the bolt carrier.

The SEAR engages with the bent of the Bolt Carrier, and, when engaged, holds the bolt carrier in the retracted position with the breech open.

When the trigger is pulled, the sear is depressed, releasing the bolt carrier. The bolt-closing spring then closes the breech; the bolt carrier, on reaching its forward position and having locked the bolt, releases the automatic sear, the hammer falls on to the striker, and the cartridge is fired.

The bolt carrier and bolt are then thrown back by the main-spring, and, if the tripper be placed so as not to be engaged by the bolt carrier, the breech again closes, and automatic firing results, until the trigger is released and the sear is permitted to again engage and hold the bolt carrier with the breech open.

If the tripper is placed so as to engage the bolt carrier, the bolt carrier will, when thrown back by the main spring, strike the tripper, and so disengage the drawbar from the sear, which at once rises and engages the bolt carrier, thus producing only one shot for each pull of the trigger.

The SAFETY BOLT is contained in the trigger guard, and engages with the trigger.

Firing is commenced from the open position of the breech, and also ceases with the breech open, and without a cartridge in the chamber of the barrel.

The SPRING TUBE lies underneath the barrel, and its rear end is seated in a recess in the crosshead. Its front end is held in position by the forend cap. It is provided on its top side with two projections which extend upwards to contact with the barrel. The forward projection forms a support for one end of the front tube cover, which protects the portion of the spring tube where it is cut away for the travel of the piston, the other end being held by the forend cap. The rearmost projection forms a stop for the connecting arm and rear tube cover.

The underside of the spring tube is provided with two studs which engage with corresponding lugs on the spring tube protector, and thus the spring tube is securely fastened to the crosshead.

The CONNECTING ARM is attached to the head of the inner tube, its rear end passing through the crosshead and engaging the bolt carrier, to which it is attached by the connecting bolt.

The openings in the spring tube are protected by sheet metal covers.
The SPRING TUBE PROTECTOR is a bar of T section fastened at its rear end to the crosshead below the spring tube seating, by the crosshead screw which also fastens the front end of the trigger guard. The front end engages in, and is held in position by, a slot in the forend cap.

The BIPOD MOUNTING (Patent No. 128,165) is attached to the spring tube protector, and the legs, when released, swing outwards and forwards until in position to support the gun. When not in use the legs are swung inwards and rearwards until they lie against the spring tube protector, and in this position are held by a strap attached to the crosshead screw.

The AUTOMATIC MECHANISM is contained in the spring tube.

The FORESIGHT folds down to facilitate the gun being pushed into a bucket or cover.

The ROTARY MAGAZINE (Patent No. 119,960) fits over the stud on top of the crosshead, and is fastened in position by a lever on the right side of the body. This magazine, as preferably constructed, holds the cartridges in two rows.

The gun may alternatively be served by a box magazine, for which the socket is attached to the gun in the same manner as the rotary magazine, so that the same gun will take both rotary and box magazines. With both types the cartridges are spring-fed, and there is no feed mechanism operated by the gun to cause jams.

The gun is also provided with a light detachable five-round magazine which can be charged on the gun by means of ordinary chargers, so that the gun can be used, with single shot fire, as a self-loading rifle, with the large magazines kept in reserve until an opportunity occurs for the employment of fully automatic machine-gun fire.

The normal rate of automatic fire is about 450 shots per minute. This rate can be increased to over 1,000 by increasing the strength of the main spring and bolt-closing spring.

INSTRUCTIONS:

There are a few points in connection with the gun and magazine which the firer should remember.

On ceasing fire, even temporarily, the breech should be immediately opened so that a current of air may pass through the barrel to facilitate cooling.
BEARDMORE-FARQUHAR LIGHT MACHINE GUN (.303-inch).

READY FOR ACTION WITH ROTARY MAGAZINE (81 CARTRIDGES).

WITHOUT MAGAZINE  BIPOD MOUNTING FOLDED
BEARDMORE-FARQUHAR LIGHT MACHINE GUN MAGAZINE.

CAPACITY: 81 .303-IN. CARTRIDGES.

TOP VIEW

UNDERNEATH VIEW WITH BOTTOM PLATE REMOVED.
14.—Hold the inner tube so that it cannot be projected by the bolt-closing spring, and disconnect the bolt carrier.

15.—Retaining the hold of the inner tube, and holding the bolt-closing spring compressed on the central rod, remove the inner tube from the central rod.

16.—Lift the central rod and bolt-closing spring out of the tube seating.

17.—Remove the bolt-closing spring from the central rod.

TO DISMOUNT THE BOLT.

1.—Remove the body cap cover plate by pressing down the retaining plunger with the point of a bullet, and pulling the cover plate rearwards.

2.—Take out the trigger guard retaining bolt.

3.—Pull the trigger guard downwards until it disengages from the body cap.

4.—Turn the butt and body cap one-third of a turn to the left when the interrupted threads of the screw will disengage, and then pull rearwards away from the body.

5.—Disconnect the bolt carrier from the connecting arm and pull the bolt carrier rearwards until it disengages from the body, bringing with it the bolt and the dust slides.

The tube protector and trigger guard can be dismounted by taking out the crosshead screw.

TO STRIP THE BOLT.

1.—Turn the extractor clear of the locking lug.

2.—With one of the dust protectors, or a screwdriver, lift the front end of the extractor until it is just clear of the bolt, then push the extractor forward until the part which fits into the recess in the front of the bolt is beyond the bolt nose, when the extractor can be disengaged from the extractor ring. (The extractor ring should not be dismounted from the bolt.)

3.—Turn the cocking piece of the bolt until it will disengage from the bolt head.

4.—The striker, ejector spring and ejector can then be removed from the bolt head.

TO STRIP THE MAGAZINE.

Turn the top disc slightly to the left until the key can be removed.

Let the top disc revolve until the spring is run down.
BEARDMORE-FARQUHAR 5-inch MACHINE GUN.

READY FOR ACTION,
MAGAZINE CAPACITY 29 CARTRIDGES.

WITHOUT MAGAZINE,
MOUNTING FOLDED
DURING FIRING.

Open the breech immediately you cease fire, even temporarily, and immediately the gun stops firing from any cause, whether on account of a miss-fire or on the order to cease firing, or on account of the magazine being empty.

Never leave a cartridge to bake and possibly explode unexpectedly in a hot chamber.

AFTER FIRING.

Open the breech and leave it open until the barrel is cool.

After the barrel is cool (not before) dismount the cylinder, pass the reamer through it, and clean it.

N.B.—Never use the reamer unless the cylinder is dismounted.

Clean the gas aperture with the gas aperture drills.

Oil the bolt.

Oil the slide grooves of the bolt carrier.

The above should be carried out if possible after not more than 1,500 rounds have been fired.

After 2,500 rounds have been fired without cleaning, the cylinder may become so foul as to interfere with the automatic action.

After firing, if there is ample time to do so, the automatic mechanism and bolt should be completely dismounted, cleaned and examined, and the barrel cleaned.

Before leaving the gun, ease the hammer spring by closing the breech.

THE REGULATOR.

The function of the regulator is only to regulate the pressure of the gas in the cylinder.

It has no influence on the rate of firing.

Screwing in the regulator reduces the space between it and the piston, and thus gives the gas greater power to force the piston rearwards.

The regulator should be screwed in until the piston will compress the mainspring regularly and without failure.

If screwed in further than is necessary for this, the effect is to subject the mainspring to unnecessary violence.

Light Guns are adjusted for firing with the regulator screwed in to the full extent, and therefore no adjustment by the firer is required.
BEARDMORE-FARQUHAR '5-inch MACHINE GUN.

WITH AIRCRAFT MOUNTING.

WITH MAGAZINE FOR HAND LOADING.
Beardmore-Farquhar '5 inch Machine Gun.

This gun has been designed for use in, and against, Tanks, Aeroplanes, and Motor Boats.

It is provided with a light field mounting, as well as a means for attaching it to a fixed mounting in Aircraft, Tanks, and Ships.

The general design is similar to that of the Beardmore-Farquhar Light Machine Gun.

In the .5in., however, the legs of the field mounting which are attached to the spring tube protector, are each supported by a brace attached to a sliding ring on the leg. In addition, a third leg is attached, and this is braced by a rod which screws into a tube attached to the butt-stock so that the angle of elevation may be adjusted mechanically.

These three legs may all be folded in the same way as the bipod legs in the Light Machine Gun, so that the gun may be carried in an ordinary cover or gun bucket.

The butt-stock is of steel tubing screwed into the body cap. It has a steel shoulder piece and an arrangement for absorbing the shock of recoil.

The ammunition employed gives a muzzle velocity of 2,800 f.s. with a bullet of armour-piercing type.

Two kinds of magazines can be used:

1.—A circular magazine of the sort employed with the Light Gun.

2.—A Box magazine which can be charged by hand while on the gun, and is attached to the gun in the same way as the circular magazine.

Weight of the .5in. Gun complete with field mounting 37½ lbs.
Length, with 35in. barrel, complete with field mounting 61 inches.

WITH AIRCRAFT MOUNTING.

Weight of .5in. Gun ... ... ... ... ... 28½ lbs.
Weight of swivel mounting, without socket ... ... 4½ lbs.
Length, with 35in. barrel ... ... ... ... 50½ inches.
Length behind trunnions ... ... ... ... 17½ inches.

WILLIAM BEARDMORE & CO., LTD
PARKHEAD STEEL WORKS,
GLASGOW.