A. V. ROE.

MOUNTING FOR GUNS.

APPLICATION FILED DEC. 1, 1917.

1,382,241.

Patented June 21, 1921.

3 SHEETS—SHEET 1.

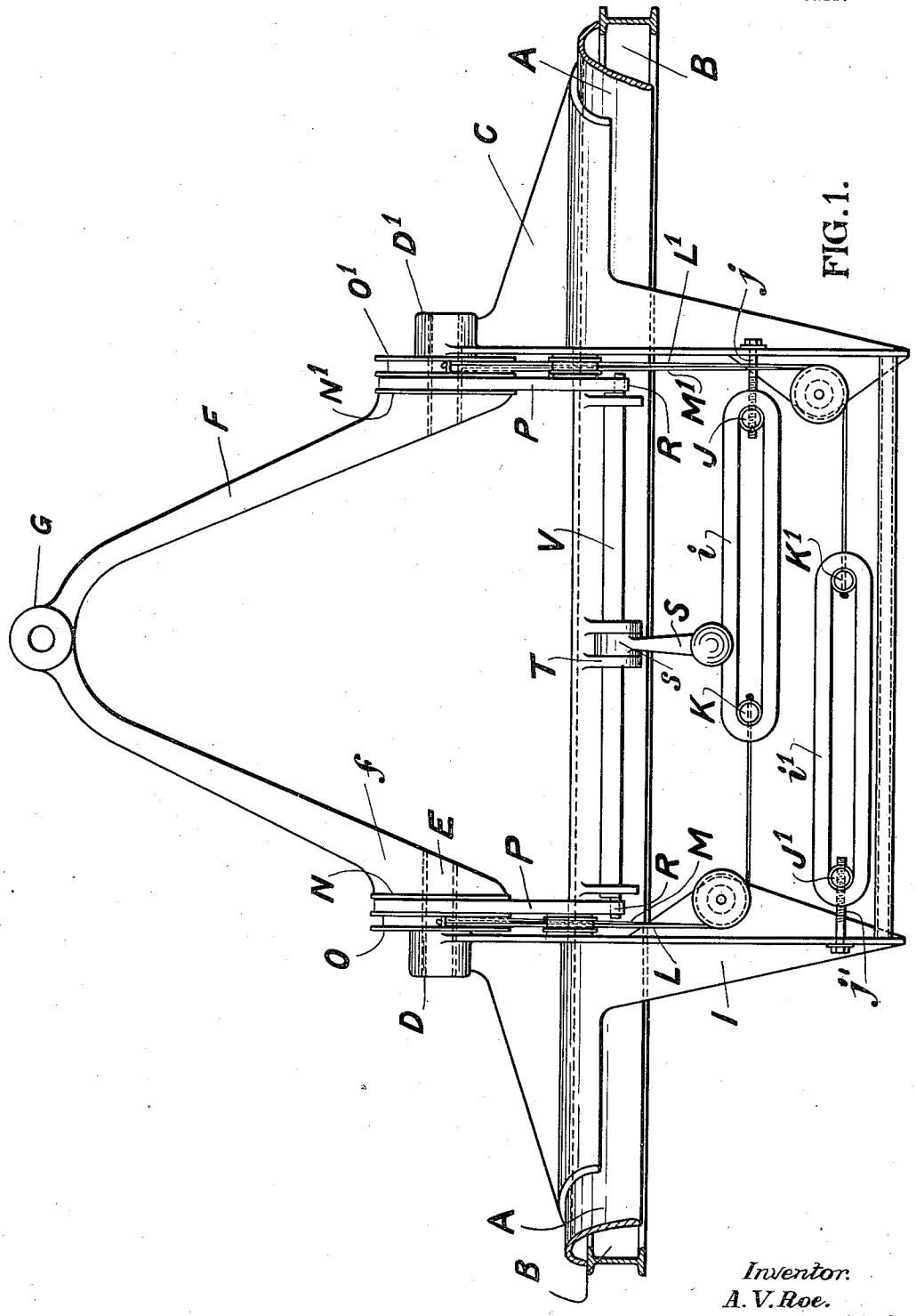


FIG. 1.

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per: Geo. A. Hutchinson
Attorney.

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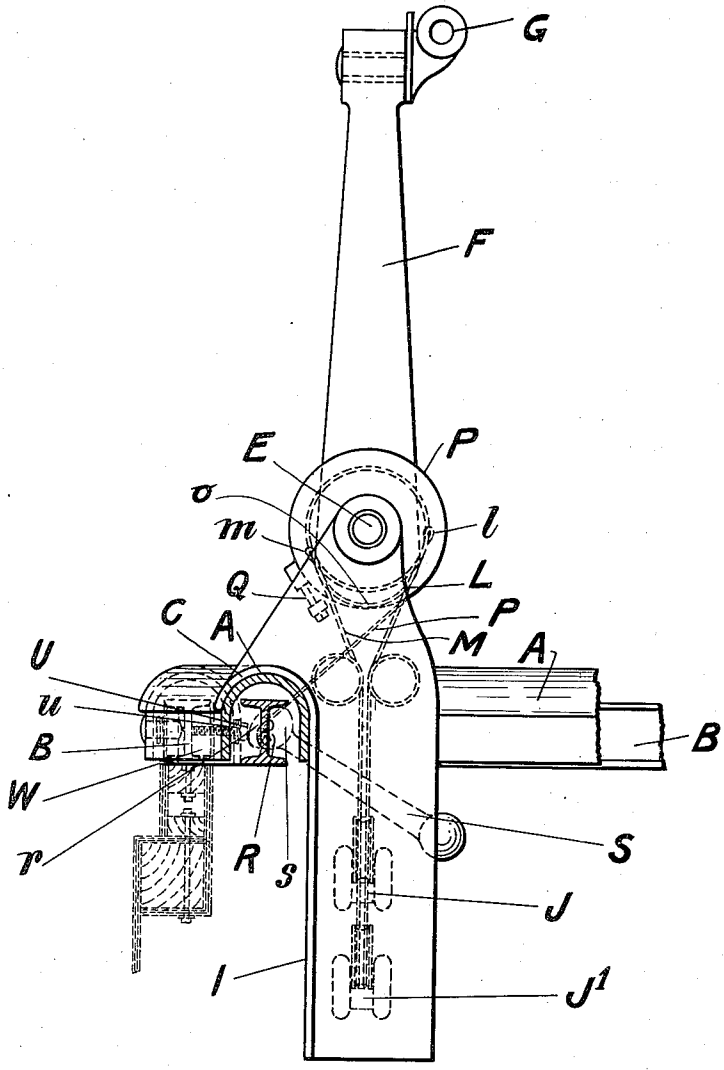


FIG. 2.

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3 SHEETS—SHEET 3.

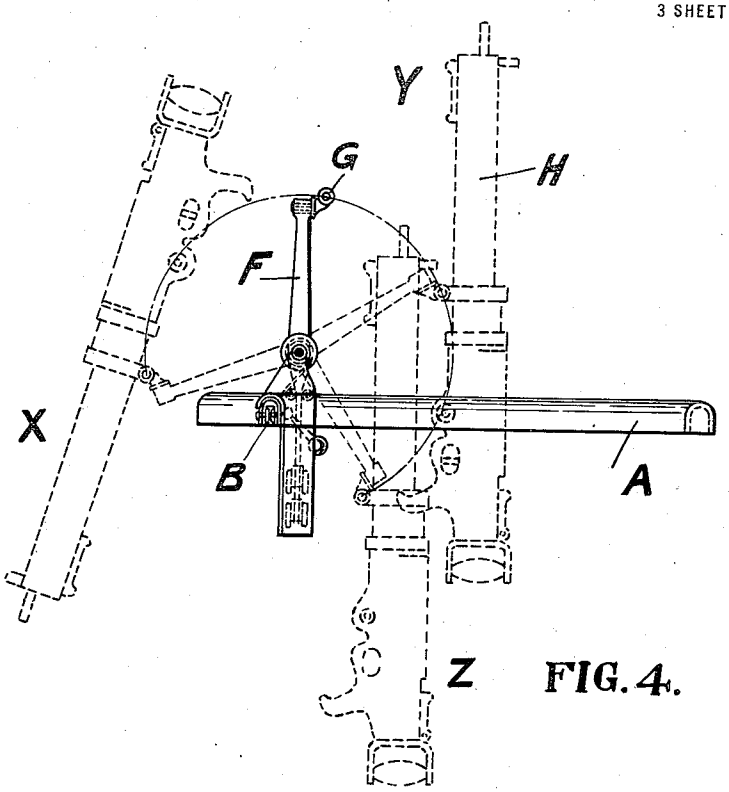


FIG. 4.

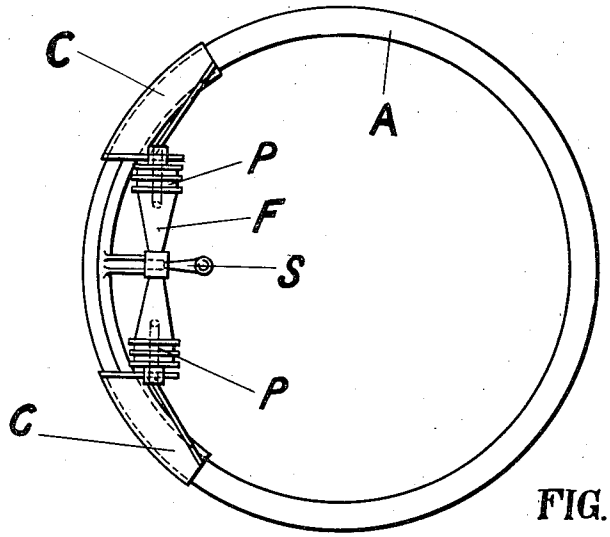


FIG. 3.

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UNITED STATES PATENT OFFICE.

ALLIOTT VERDON ROE, OF HAMBLE, SOUTHAMPTON, ENGLAND.

MOUNTING FOR GUNS.

1,382,241. Specification of Letters Patent. Patented June 21, 1921.

Application filed December 1, 1917. Serial No. 204,969.

To all whom it may concern:

Be it known that I, ALLIOTT VERDON ROE, a subject of the King of Great Britain, residing at Hamble, Southampton, England, have invented certain new and useful Improvements in Mountings for Guns, of which the following is a specification.

This invention relates to improvements in the construction of a barbette mounting for carrying a gun; it is adapted for use in a stationary position, or in a movable one, for instance, as found on a ship or in aircraft.

The invention is of particular application to an aeroplane and also to a rapid firing gun such as the Lewis gun, which is generally used with same at the present time.

One object of the invention is to support the gun by mechanism which will allow of greater facilities in ranging and firing the gun than heretofore, especially without exposing a gunner more than is necessary.

Other objects of the invention will appear more fully hereinafter.

Referring to the accompanying drawings, and to the various views and reference-signs appearing thereon:—Figure 1 is an elevation of the mounting as seen from the inside of the pit; Fig. 2 is an end elevation of Fig. 1, some of the parts being in section; Fig. 3 is a plan on a reduced scale showing the circular gun ring; Fig. 4 is a view showing the position of the gun at different angular positions of the arm.

The same part is designated by the same reference-sign wherever it occurs throughout the several views.

Referring to the drawings, A is a movable carriage ring which rotates about a stationary roller ring B in the known manner, being supported by the rollers 1 carried on the rotatable ring A by the pins 2. Additional segment brackets C are firmly attached to the ring A and have the pivot supports D, D′ constructed on the segments C and arranged to carry the hollow pivot spindles E, upon which is mounted the forked arm or lever F with bearings *f* at its base. The arm F is provided at its forward end with a bracket G, to which the gun H is secured by means of a pivot bolt so that it can tilt or rotate thereon.

Downward extensions I of the segment brackets C are constructed with bolts *j*, *j′* having bobbins J, J′ attached to them, upon which are carried double wrappings *i*, *i′* of flexible rubber cord, the other end of the loops thus formed being carried by other bobbins K, K′, to which are attached the pairs of cables, or straps L, M and L′, M′ respectively; integral with the arm F, or firmly attached thereto and rotatable therewith on the pivot spindle E are a pair of drums O, O′ to which the ends of the cables L, M and L′, M′ are attached at points *l*, *m*. The drums O, O′ may have cam pieces such as *o*, attached as shown in Fig. 2 if desired for the purpose of increasing the leverage of the counter-balance cables against the increased leverage of the gun when in its horizontal position.

Referring to Fig. 2, the arrangement is such that if the gun arm tilts to the left, the cable L is put in tension and the cable M is slackened, whereas, if the gun arm is pulled to the right, the cable M is put in tension and the cable L slackened. In either case the rubber cords *i*, *i′* attached to the cables are stretched, and it should be noticed that, by this arrangement, as the gun arm arrives, say, at its horizontal position in either direction, the respective rubber cords *i*, *i′* are stretched to a correspondingly greater extent and thus counteract the effect of the leverage around the pivot point E. It should further be noted that the pulleys O, O′ may be attached eccentrically, or may be fashioned as cams, so as to counterbalance the stretch of the rubber at every point against the varying load in different positions of the gun. If only the outward travel of the arm requires to be counterbalanced only the one cable L is required for O, and L′ for O′.

Also attached to the pivot spindle E or directly to the bearings *f* of the arm F are drums N, over which steel bands P are passed, preferably lined with leather or fiber; the ends of these bands are fastened to fixed lugs on the bracket C by means of adjustable bolts, and said bands proceed, one on each side of the arm F, to the crank pins R carried by the shaft to which is keyed the boss *s* of the lever S which is pivoted in the bearings T on the movable carriage ring A. By turning the lever S down into the position shown in Fig. 2, the bands P are tightened on the drums N and secure the gun arm F in place in consequence. A cam projection *r* is formed on the boss *s* of the lever S and actuates a bolt

U against the action of a spring *u* just beneath its head, whereby the wedge W is pressed tightly against the stationary roller ring B and thereby locks the movable ring A with the stationary ring B, preventing movement of one relative to the other; the bolt U is threaded in the wedge W so that adjustment of pressure may be effected. Upon raising the lever S, first the wedge W is released, and the ring A can then turn around the ring B, and secondly, the bands P are slackened and the gun arm F can then be tilted to any position.

In operation, the gun is first brought into position on the ring B by turning the ring A carrying the pivot supports D, D′, the arm F being set approximately to the correct angular position to suit the target aimed at, and the gun is tilted about its pivot G and directly aimed at the target; as soon as the gunner knows that his setting is approximately correct, he presses down the lever S and thus locks the arm in its angular position, and immediately thereafter and by the same movement, locks the ring A on the ring B, the gun being then in secure position for firing.

As will be seen on reference to Fig. 4, the positions X, Y and Z are readily obtained by this invention; in the position X, firing vertically downward may be accomplished without undue exposure of the gunner. In the position Y, he may fire directly upward, being wholly protected, except from above; and in the position Z, which is the position out of use, it will be seen that only the barrel of the gun projects above the gun mounting, thereby giving rise to the least possible amount of resistance due to air pressure on the gun. In the positions Y or Z as shown, it is quite easy for the gunner to move the gun to any position on the ring B, since the wind pressure is so small, whereas, with the greater part of the gun exposed, as in position X, or when horizontal, so great is the wind pressure on the gun when flying fast, that a considerable force needs to be exerted in order to get the gun around against the wind.

Though primarily intended for the gun pit of an aeroplane, or other craft, it will readily be seen that the stationary ring B may be fixed to any convenient site, whether on a building, a ship, or otherwise, and it will work in substantially the same way and will have the same advantages.

This invention also enables the gunner to keep more within the aeroplane body than has hitherto been feasible at the present time; there is no need for him to throw his head and shoulders well out for the purpose of balancing the gun against the wind pressure when flying in order to enable him to swing the gun around; this extra head resistance slows the machine in practice, whereas, with my invention, very little head resistance is offered when in action, and practically none when the gun is out of action, because at its inward limit the gun is brought substantially on to the axis of rotation.

Further, by employing a forked support for the gun, the latter may be brought much nearer to the gun ring in its horizontal position by reason of the fact that the rear part of the gun can come down on to the gun ring itself without any gear being in the way, as is the case when the pivot support is directly beneath the gun.

The several features of the present invention are not limited to the precise construction and arrangement of devices described, and many modifications and changes may be made therein without departing from the spirit of this invention.

What is claimed is:—

1. In a rotatable gun mounting, the combination of a fixed base ring with a rotatable channel ring, a pair of pivot supports on the latter, a forked gun arm with a pair of pivot members in the said pair of pivot supports, a pair of drums, one on each pivot concentric with its pivot member, a tension band associated with each drum, a crank shaft connecting the two tension bands, and a control lever rotating the said crank shaft so as to apply tension to the said tension bands, substantially as and for the purpose set forth.

2. In a circular gun mounting, a fixed base ring, a rotatable channel ring thereon, with means for supporting same, a pair of pivot supports on the said channel ring, a forked gun arm pivoted in the said supports, a cam on each arm of the fork around its pivot, a flexible counter-balance device connected to each said cam, interior downward extensions of the said channel ring, and an adjustable anchorage thereon for each counter-balancing device, substantially as described.

In testimony whereof I affix my signature.

ALLIOTT VERDON ROE.

Witnesses:
HARVEY J. BAVERSTOCK,
CHARLES PACK.