To all whom it may concern:

Be it known that I, GEORGE HENRY CHALLENGER, a subject of the King of Great Britain, residing at Vickers House, Broadway, Westminster, in the county of London, England, have invented certain new and useful Improvements in or Relating to Bullet-Deflectors for the Propellers of Aeroplanes and Similar Aircraft Provided with Guns, of which the following is a specification.

This invention relates to aircraft and has particular reference to "tractor" aeroplanes of the kind carrying a gun. In single seated aeroplanes when the gun is fixed and the pilot takes aim by suitably maneuvering the aeroplane, it is desirable that the muzzle of the gun should be pointed in the direction of the line of flight of the aeroplane, this result being possible with machines of the "pusher" type because they permit a clear field of fire ahead, whereas in the "tractor" type the propeller prevents this clear field of fire being obtained. The "pusher" type is, however, inferior in speed to the "tractor" type.

It has been proposed to provide a "tractor" aeroplane with a gun which fires between the blades of the propeller and for this purpose several arrangements have been tried, such as arming the propeller blades at the points where the bullets may strike, so that the gun can be fired continuously when desired and the propeller blades deflect the bullets that strike them; such arrangements however, seriously impair the efficiency of the propeller, in some cases to such an extent that the superiority in speed of the "tractor" type of aeroplane is lost.

The chief object of the present invention is to provide means whereby the bullets that leave the gun while the propeller blades are in the line of fire are deflected without impairing the efficiency of the propeller.

According to the invention there is interposed between the muzzle of the gun and the propeller, a rotary bullet deflecting member which is so constructed, arranged and driven that when any one of the propeller blades is in the line of fire, it will be protected from bullets fired by the gun. The said rotary bullet deflecting member has blades whose dimensions are determined by the position occupied by the said member in relation to the propeller and the gun and by the width of those portions of the propeller blades that would be liable to be struck by the bullets if the said member were not provided. The said rotary member may be mounted so that its axis of rotation is parallel to the axis of rotation of the propeller, or it may, if desired, be so arranged that its axis of rotation is at an angle to the axis of the propeller.

In order that the said invention may be more clearly understood and readily carried into effect the same will be described more fully with reference to the accompanying drawings, in which:

Figure 1 is a diagram showing a form of the invention in which the axis of the rotary bullet deflecting member is parallel to the axis of the propeller.

Figure 2 is a diagram similar to Fig. 1 showing a form of the invention in which the axis of the rotary bullet deflecting member is at an angle to the axis of the propeller.

Figure 3 is an end elevation on a larger scale of the rotary deflecting member shown in Fig. 1 as viewed from the position occupied by the gun.

Figure 4 is a sectional side elevation showing, on an enlarged scale, the bullet deflecting member of Fig. 2, and

Figure 5 is a plan of Fig. 4.

A is the propeller and A' is the gun. B is the rotary bullet deflecting member which is driven by gear wheels, b, b', b'', b''', from the propeller shaft or other part actuated by the motor, in such a manner that when one of the propeller blades is in line with the gun barrel, one of the blades of the deflecting member will be interposed between the muzzle of the gun and the propeller blade. In the examples shown the propeller is assumed to have two blades and the rotary member B to have two deflecting blades, in which case the said member will have to be driven at the same speed as the propeller. The rotary member B and the propeller need not however have the same number of blades, provided that the speed of rotation of the member B in relation to that of the propeller is so chosen that one of the blades of the member B will occupy a position between the gun and the propeller blades when the lat-
ter are in the line of fire and provided that the blades of the said member are of suitable width having regard to the speed of rotation of the member B in relation to that of the propeller.

The blades of the rotary member B are made of hard steel and are bent or curved so that the bullets are merely turned or deflected from their normal course instead of being stopped; in this manner we decrease as far as possible the deleterious effects of the blows given by the bullets to the said blades.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a gun-carrying aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a displaceable member and means for moving said member into the line of fire when the projectiles fired by the gun would otherwise hit the propeller blades.

2. In an aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a projectile deflecting member placed between the muzzle of the gun and the propeller and means for displacing said member so that it will be in a position to deflect the projectiles fired by the gun when they would otherwise hit the propeller blades.

3. In an aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a projectile deflecting member placed between the muzzle of the gun and the propeller and means for rotat-

ing said member so that it will be in a posi-
tion to deflect the projectiles fired by the gun when they would otherwise hit the propeller blades.

4. In an aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a projectile deflecting member placed between the muzzle of the gun and the propeller and means driven by the propeller engine for displacing said member so that it will be in a position to deflect the projectiles fired by the gun when they would otherwise hit the propeller blades.

5. In an aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a projectile deflecting member placed between the muzzle of the gun and the propeller and means driven by the propeller engine for rotating said member so that it will be in a position to deflect the projectiles fired by the gun when they would otherwise hit the propeller blades.

6. In an aircraft, the combination with a gun for firing between the blades of the aircraft propeller, of a projectile deflecting member having inclined blades the said member being placed between the muzzle of the gun and the propeller and means for rotating said member so that its inclined blades will deflect the projectiles fired by the gun when they would otherwise hit the propeller blades.

In testimony whereof I affix my signature.

GEORGE HENRY CHALLENGER.